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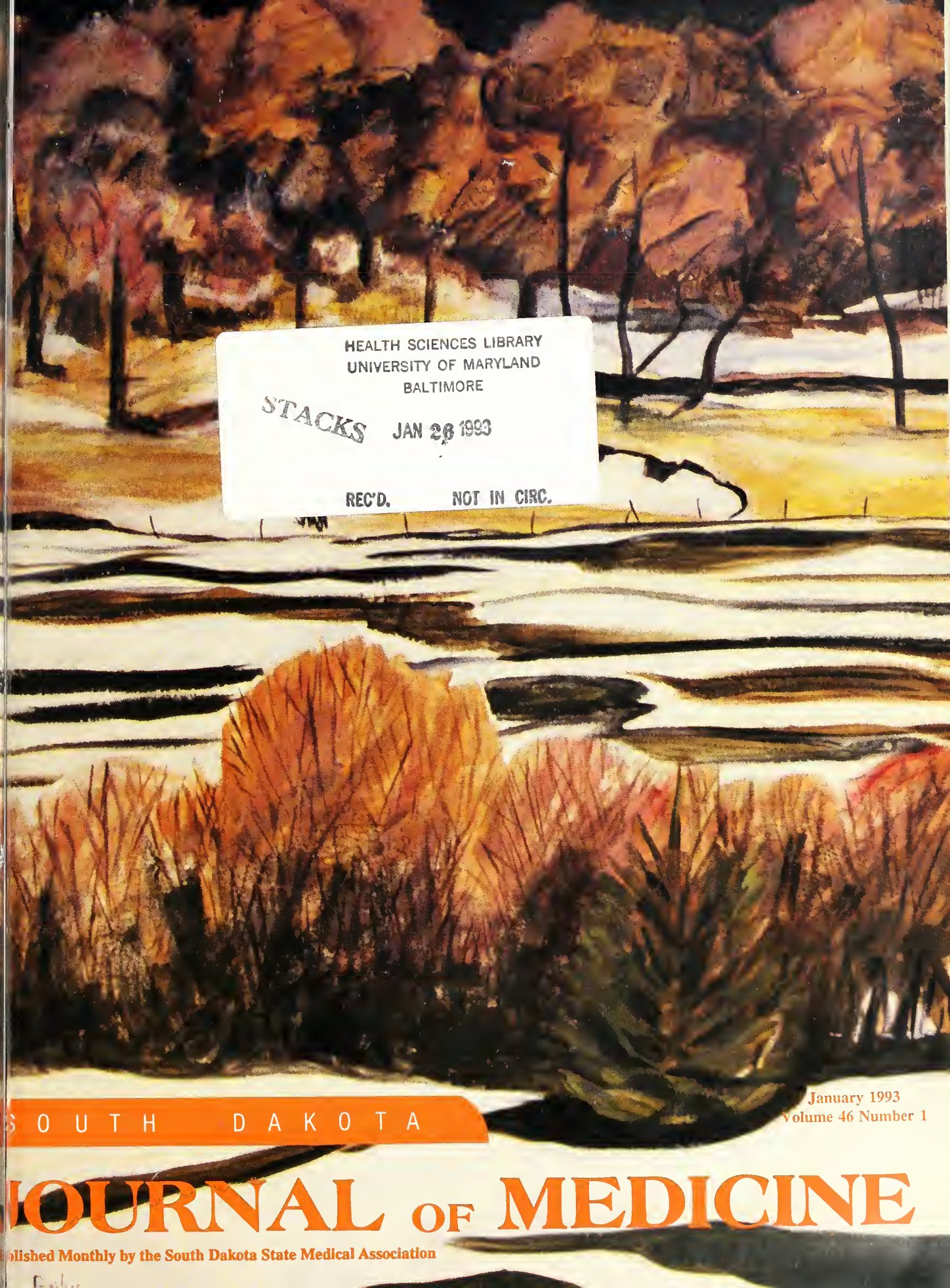
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January 1993  
Volume 46 Number 1

# JOURNAL OF MEDICINE

Published Monthly by the South Dakota State Medical Association



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Volume 46/No. 1 January 1993

(ISSN 0038-3317)

Official Publication of the  
South Dakota State Medical Association

the South Dakota Chapter of the  
American College of Surgeons

the South Dakota Psychiatric Association  
of the American Psychiatric Association

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SOUTH DAKOTA JOURNAL OF  
MEDICINE (ISSN 0038-3317) is published  
monthly by the South Dakota State Medical  
Association, 1323 South Minnesota Avenue,  
Sioux Falls, SD 57105. Subscription price: \$15  
per year domestic, \$18 per year foreign, \$1.75  
for single copy. Second class postage paid at  
Sioux Falls, South Dakota 57101 and addition-  
al mailing offices. POSTMASTER: Send ad-  
dress changes to SOUTH DAKOTA  
JOURNAL OF MEDICINE, 1323 South  
Minnesota Avenue, Sioux Falls, SD 57105.

NATIONAL ADVERTISING: Contact State  
Medical Journal Advertising Bureau, Inc, 711  
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Phone: 708-383-8800.

LOCAL AND CLASSIFIED ADS: Contact  
Jeri Spars, SOUTH DAKOTA JOURNAL  
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336-1965.

PRINTER: The Ovid Bell Press, Inc, PO Box  
370, Fulton, Missouri 65251-0370.

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### About the Cover

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A number of Jean's paintings have been used on the covers of this Journal. She  
died in December of 1992.





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## President's Page



**M. George Thompson, DO, President  
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Nashville, Tennessee a break from the winter cold and slippery streets. A place to see the sun and feel warm for a few days at the Interim AMA meeting. Boy was I mistaken. I have never been so cold in my life. The temp. was 20 - 30° and with the humidity is worse than 0° in South Dakota. Freezing rain and people were sliding into ditches all over the place. There also was no sun. Outside of this and the fact we got snowed in in Chicago it was another interesting meeting.

Before I go further it must be noted that the people are very friendly. The history is exciting with the most famous citizen being Old Hickory-President Jackson. The land is beautiful and a gigantic Christmas parade with at least thirty bands went by our hotel.

The meetings at the beautiful Opryland Hotel were as busy and serious as always. As usual they started at 6:30 each morning and at least one went until 8:00 pm. Discussion covered everything from infant walkers to updated position on HIV. South Dakota's resolution on cutting down on what we feel is a run away JCAH was

voted down but we were told to keep coming back with more ideas to bring this group under control.

Taking my turn on the floor of the House of Delegates is a privilege which I wish all doctors interested in the politics of medicine could experience. The AMA does so many things that help us all. Everyone should be proud to be a member.



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# Bartholin Cyst Presenting as Inguinal Hernia

*Terry Altstiel, MD, FACS, Ronald Coster, PA*

## ABSTRACT

The clinical diagnosis of Bartholin cysts is usually very simple. This paper, however, reports a very unusual presentation, a Bartholin cyst originally thought to be an inguinal hernia. The history, anatomy, and clinical findings of Bartholin cysts are discussed, as well as a case history of this interesting presentation.

Bartholin's glands, paired glands lying inferior and lateral to the bulbocavernosus muscles in the female, are frequently the source of painful swellings necessitating surgical intervention. There is no mention in the literature, however, of a Bartholin's gland cyst presenting as an inguinal hernia. This paper reports this very unusual presentation.

## CASE REPORT

A forty-nine year old Native American female was referred to our facility for what a local physician felt to be a right inguinal hernia. The patient reported a history of a right labial mass, present since 1976, which had alternately enlarged and receded over the ensuing years. The mass was now larger than ever, representing an embarrassing physical deformity. There was no history of trauma or venereal disease. She denied inguinal pain, dyspareunia, or labial pain. No other major health problems were present.

On examination, a soft mass, beginning anterior to the right pubic ramus near the external ring, extended well into the right labium majus. The mass was nontender with the consistency of a soft lipoma. Actual fluctuance was not appreciated. A pelvic examination was unremarkable. No erythema or drainage was seen. The inguinal canal revealed no weakness or bulge.

After adequate pre-operative evaluation, the patient was brought to the operating room where exploration was undertaken. A small incision at the most cephalad

portion of the mass revealed the dome of a sausage-shaped, bluish-red cyst with a thin wall. Dissection continued along the path of the cyst, opening the labium majus. The cyst extended to the posterior-lateral vaginal wall and measured nearly six inches in length. Minimal bleeding was encountered during the excision. The patient had an uneventful recovery.

Histological examination of the specimen revealed microscopic findings consistent with a Bartholin's cyst filled with thick, nondescript fluid. The presence of an epithelial lining, in essence, ruled out the differential diagnosis of hydrocele.

## HISTORIC REVIEW

The Danish anatomist, Caspar Bartholin, lent his name to Bartholin's glands in 1677, when he described their anatomical location.<sup>1</sup>

Homologous to the bulbourethral glands in the male, Bartholin's glands serve to moisten the vestibular surface of the vulva with an alkaline, clear, viscous liquid. The glands are most active during sexual activity. Their function deteriorates after age thirty.



Epithelial lining, Bartholin cyst (hematoxylin and eosin stain).

## COMMON PATHOLOGY

On physical examination, Bartholin's glands cannot normally be palpated.<sup>2</sup> Small cysts and other abnormalities of the glands can be felt by placing the index finger into the vagina with the thumb outside and feel-



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ing along the posterior-lateral rim of the labium majus. Although neoplasms of Bartholin's glands are quite rare, cysts and abscess formation is common. Obstruction of the main duct is the most common etiology, resulting in retention of secretions and cystic dilation. Gonococcal infection may also cause obstruction, but congenital narrowing of the duct and inspissated mucus often play a role. Secondary infection with a host of organisms, especially colonic bacteria, is possible.<sup>3</sup>

### SYMPTOMS

The usual symptoms of Bartholin's duct cysts include pain, tenderness, and dyspareunia. Findings of edema, inflammation, and a fluctuant mass are common, especially with abscess formation. The patient presented in this case had none of these findings except that of a mass.

### TREATMENT

Treatment of Bartholin's cysts has run the course from warm packs to laser excision. Incision and drainage alone has a high recurrence rate but gives immediate symptomatic relief.<sup>4</sup> Excision is frequently complicated by morbidity from excessive bleeding, hematoma, or scar formation. Most texts have recommended marsupialization as the treatment of choice, although laser excision/ablation has proved an effective and easy alternative which can be performed rapidly with very good results and little patient discomfort.<sup>5</sup> Antibiotics are used when appropriate in the presence of abscess or infection. The case presented was treated with excision due to the presentation and size of the cyst.

### CONCLUSION

Bartholin's duct cysts are typically quite small and significantly tender. Despite the large size of this cyst, the patient had surprisingly few symptoms. This unusual presentation of a Bartholin's cyst broadens the differential diagnosis of masses found near the external inguinal ring.

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### AUTHORS

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**Description:** Yohimbine is a 3a-15a-20B-17a-hydroxy Yohimbine-16a-carboxylic acid methyl ester. The alkaloid is found in Rubaceae and related trees. Also in Rauwolfia Serpentina (L) Benth. Yohimbine is an indolalkylamine alkaloid with chemical similarity to reserpine. It is a crystalline powder, odorless. Each compressed tablet contains (1/12 gr.) 5.4 mg of Yohimbine Hydrochloride.

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**Warning:** Generally, this drug is not proposed for use in females and certainly must not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

**Adverse Reactions:** Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug.<sup>1,2</sup> Also dizziness, headache, skin flushing reported when used orally.<sup>1,3</sup>

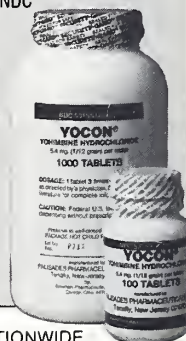
**Dosage and Administration:** Experimental dosage reported in treatment of erectile impotence.<sup>1,3,4</sup> 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to 1/2 tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.<sup>3</sup>

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### References:

1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
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One of the earliest employed and most commonly used FNA techniques has been for thyroid nodules. LiVolsi has summarized a number of studies and concludes that FNA of the thyroid is cost effective, patient acceptable, attended by only rare complications and should become the primary method to evaluate thyroid nodules. She goes on to provide data that the diagnostic accuracy for FNA in many thyroid lesions such as benign goiters, thyroiditis and the common thyroid malignancies such as papillary, medullary, anaplastic carcinoma and lymphomas are over 90%. This would seem to settle the question but the accuracy is not 100% and there are both false positive and negative diagnoses. How can these be reduced to a minimum?

Thyroid nodules are very common but malignant nodules are relatively rare compared to benign nodules. The object is to perform surgery only on the malignant lesions leaving benign nodules in place and avoiding unnecessary surgery on benign disease.

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1) Since the quality of the aspirate and the ability to interpret the aspirated smears improve with experience, in areas where only a limited number of thyroid aspirations are performed, it would seem wise to limit the procedure to a few individuals if possible.

2) There must be bidirectional communication between the aspirator and the pathologist to improve the quality of the specimen and provide proper communication. Reports must be worded in a way that provides the information desired by the aspirator.

3) Certain clinical factors may indicate the need for surgery without an FNA or despite the fact the FNA shows no definite tumor. Symptoms suggesting invasion of neck structures is particularly ominous. Rapid tumor growth, a very firm nodule, vocal cord paralysis, enlarged regional lymph nodes, distant metastases or family history of medullary thyroid car-

cinoma should also be factors which can indicate thyroid surgery with or without an FNA procedure.

4) More carcinomas of the thyroid occur in females than males but a thyroid nodule has a higher chance of being malignant in a male than a female. In a male over 60, the change of malignancy is particularly high and surgery should be seriously considered in this group.

5) The initial thyroid aspirate is only the beginning. Careful clinical follow-up is mandatory. The response of the nodule to thyroid suppression or changes in the consistency or nature of the nodule must be evaluated over time. A second aspiration or surgery may be indicated. The person following the patient, usually the aspirator, must be well versed in the natural history of thyroid neoplasms and be aware of the limitations of the FNA.

6) Thyroid FNA has limitations. Follicular carcinoma (5%-10% of thyroid carcinomas) is only distinguished from the far more common follicular adenoma by the presence of vascular and/or capsular invasion often requiring multiple histologic sections after removal of the nodules. Therefore, follicular carcinoma will be missed if one depends on FNA alone. Incidentally, frozen section at the time of surgery also has a high failure rate in detecting this lesion.

7) A multinodular goiter has a significant chance of harboring a malignancy.

John F. Barlow, MD  
Editor

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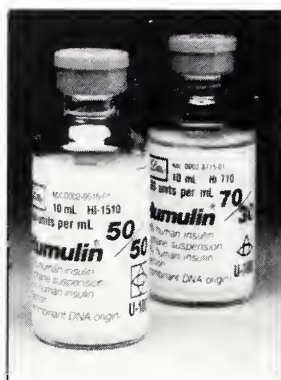




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| Shoener, Jerry J. (R)     | 34    | Rapid City       | 343-2486  |
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# The State of South Dakota's Child: 1992

Ann L. Wilson, Ph.D

## Editorial Note:

The University of South Dakota School of Medicine is pleased once again to provide this report on the health of our state's children. The central topic of this year's report is injury prevention. This health concern highlights the important role health professionals may play in assisting their patients develop life long habits that will prevent tragic injuries and death that are so draining of human and economic resources. We recognize and applaud the Health Education and Promotion Program of the South Dakota Health Department for its establishment of the new Office of Disability Prevention and look forward to collaborating with its services that will reach South Dakota's citizens.

R.C. Talley, MD, Vice President/Dean  
USD School of Medicine  
Sioux Falls, SD

## ABSTRACT

This annual report on South Dakota's children shows that the state's birth rate in 1991 has again dropped and is below the national rate. In recent years there has been progress noted in the utilization of first trimester prenatal care and the state's infant mortality rate is comparable to that observed nationwide. Injuries, the leading cause of death in childhood, is the focus of this year's report. The rate of death due to childhood injuries is higher in South Dakota than is observed nationwide. Injuries are responsible for 51% of all deaths among 1 to 4 year olds, 70% of those of 5 to 14 year olds and 82% of all deaths of those 15 to 19 years of age. Strategies for the prevention of this tragic loss of life are discussed and the continued need for broad-based educational efforts and public policy that promote safe habits is described.

*If some infectious disease came along that affected one out of every four children in the United States, there would be a huge public outcry and we would be told to spare no expense to find the cure — and to be quick about it.*

Surgeon General C. Everett Koop, in testimony to the U.S. Congress on the problem of childhood injuries, February 9, 1989.

Reviewing the state of South Dakota's children provides an opportunity to examine the health of the youngest of our state's citizens. Though sadness always accompanies this task of analyzing the tragic deaths of infants and children, hope for how such losses may be prevented in the future also is felt during this annual endeavor. This is especially true with the central topic of this year's review: childhood injuries and their prevention.

This report, as those of the past, will examine births and infant deaths in the state and will then focus upon

injuries, the leading cause of death in childhood.<sup>1</sup> This topic is especially poignant as these fatal injuries are potentially preventable and compel personal and community action. Indeed, current conceptualization of this cause of loss of life demands that what in the past have been identified as "accidents" must now be termed "injuries".

The word "accident" implies an event of fate over which one has no personal control. Analyses of "accidental" deaths, however, identify how they could have been prevented had greater care and precaution been exercised. The excruciating pain that accompanies the death or injury of a child may be assuaged by the notion of "accident", and certainly inflicting guilt at a time when all involved are so emotionally distraught would be cruel. Alternately, the encouragement of personal behaviors and the development of public policies that decrease injuries and death for children benefit all of society and will be considered in this report.



## BIRTHS

The total number of births of South Dakota residents in 1991 declined for the ninth consecutive year with 10,928 new babies becoming citizens of our state.<sup>2</sup> This number represents an 18% decline in annual births compared with that observed in 1980. As can be seen in Figure 1, in 1991 our 15.4 rate of birth per 1,000 population for the fourth consecutive year was below that of the United States.<sup>3</sup> In the most recent years, 15% of all births in the state have been of American Indians compared to 12% observed in the early 1980s.<sup>2</sup> Approximately 33% of all South Dakota's newborns are residents of Pennington or Minnehaha counties with 43% of all deliveries in the state currently occurring in these two counties.<sup>2</sup>

Prenatal care has certainly received a great deal of attention in recent years as studies have documented its cost effectiveness.<sup>4,6</sup> In the past ten years improvement in the utilization of first trimester care has been achieved for the white and the American Indian populations of the state. Currently, approximately 82%

of all white and 60% of all American Indians are receiving care in the early months of their pregnancies.<sup>2</sup> Though this observation documents progress, it fails to achieve the Surgeon General's goal for 1990 of a 90% utilization of first trimester prenatal care.<sup>7</sup>

In recent years, public assistance for prenatal care has been expanded. A woman whose income is below 133% of the federal poverty level qualifies for Medicaid coverage for prenatal care regardless of marital status. Nonetheless, there are indications in the state that some women experience difficulty accessing services in spite of having this financial coverage for prenatal care. In 1991, 127 women (1.2%) received no prenatal care prior to giving birth and 365 (3.4%) women did not receive care until the last trimester of their pregnancies.

## INFANT MORTALITY

Long recognized as a very sensitive indicator of a society's well being, the infant mortality rate reveals progress in medical care and the social circumstances of a community. One year shy of the Surgeon General's goal for 1990, in 1991 the infant mortality rate for the United States fell below 9.0 at 8.9 infant deaths per 1,000 live births.<sup>3</sup> South Dakota has not achieved this goal. In 1991, the state's infant mortality rate was 9.4 with a five year mean (1986-1991) rate of 9.8. Progress in decreasing infant mortality in both the country as a whole and in South Dakota is portrayed in Figure 2.

In South Dakota there has typically been great disparity in health indicators for the white and the American Indian infants. The greatest disparity in infant mortality rates typically appears between the white and the American Indian post neonatal mortality rates (deaths occurring between the 28th and the 365th days of life). The 1991 state data, however, show that the American Indian post neonatal mortality rate is the lowest ever recorded at 7.2. Though lower than in the past, this rate is still more than twice the white rate of 3.2. In spite of this progress, the 1991 total South Dakota post neonatal mortality rate of 3.9 is higher than the United States' estimated rate of 3.4.<sup>2,3</sup>

The 1991 neonatal mortality rate (deaths between birth and the 27th day of life) for the state (5.5) equals that of the estimated rate for the United States. The most recent five year mean (1987-1991) South Dakota neonatal mortality rate is 5.2 compared to 6.0 for the United States. Both achieved the Surgeon General's goal of a neonatal mortality rate of 6.0 for 1990.<sup>2,3</sup>

## CAUSES OF INFANT DEATH

The pie charts in Figure 3 present the distribution of deaths by various causes for infants in South Dakota for the years 1986-1990 compared to those in 1988 for the United States.<sup>8-13</sup> Over half of the causes of

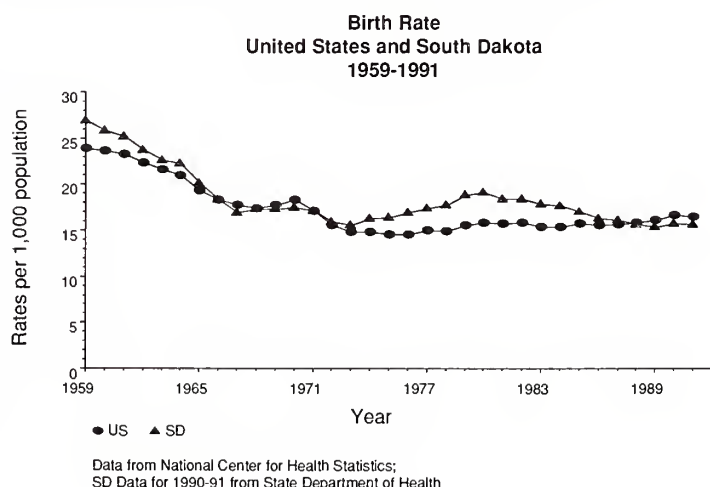


Figure 1

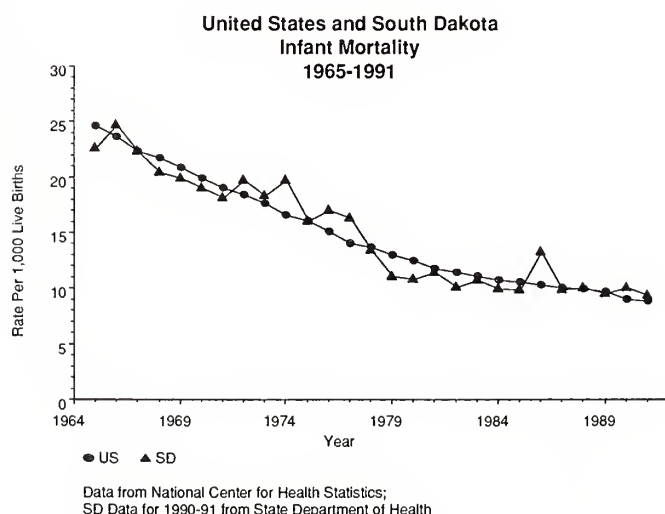


Figure 2

### South Dakota and United States Causes of Infant Death

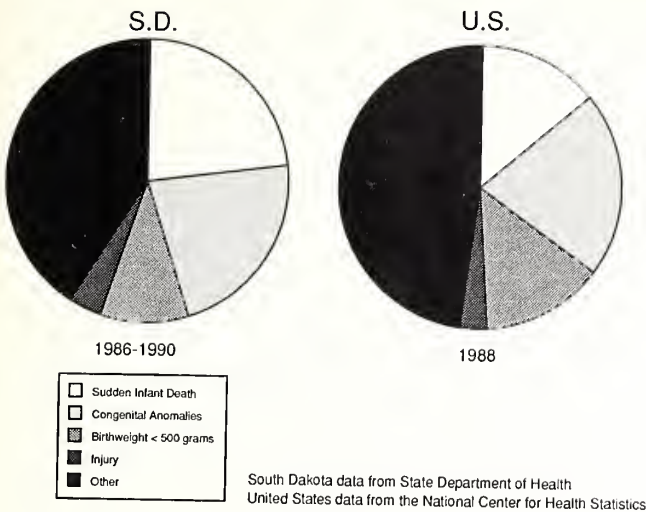


Figure 3

infant death (SIDS, congenital anomalies, birth weight less than 500 grams, and injuries) are associated with factors that may not be responsive to medical care. These data highlight the need for preventive community based care. Nearly a quarter of all infant deaths in South Dakota are attributed to Sudden Infant Death Syndrome (SIDS). Though concern exists regarding how mortality may be attributed to this cause without confirmation by autopsy, the rate of SIDS in South Dakota is higher than that observed nationwide. This is especially true for the ethnic minorities (primarily American Indians) in the state. For the years 1986-1990, the mean SIDS rate for these populations of residents of the state was 7.0 per 1,000 live births compared to the United States' 1988 rate of 2.0.<sup>8-13</sup> In South Dakota, the mean SIDS rate (1.5) for whites for these years also was higher than the rate (1.2) for the white population nationwide. Though the causes of SIDS are not understood, a clear relationship has been established between SIDS and pre and postnatal exposure to smoking, a preventable behavior.<sup>14</sup>

Very similar to data for the country as a whole, are those from South Dakota that show that congenital anomalies contribute to 22% of all infant deaths. Assuming 100% mortality, extreme low birth weight of less than 500 grams is the cause of approximately 10% of all infant deaths

Table I  
Rates of Childhood Deaths and Fatal Injuries

|                  | Total Death Rate |      | Fatal Injury Rate |      |
|------------------|------------------|------|-------------------|------|
|                  | SD               | US   | SD                | US   |
| 1 - 4 Years *    | 62.4             | 50.9 | 32.2              | 22.2 |
| 5 - 9 Years **   | 26.5             | 24.2 | 18.6              | 12.7 |
| 10 - 14 Years ** | 25.0             | 27.5 | 16.8              | 15.8 |
| 15 - 19 Years ** | 100.9            | 88.0 | 83.5              | 69.7 |

\* South Dakota 1987-90; United States 1988

\*\* South Dakota 1986-90; United States 1988

Rates per 100,000 population

Data from the South Dakota Department of Health and the National Center for Health Statistics

in South Dakota. Rarely a baby born with this weight survives and the hope for survival of infants of this weight group rests in promoting the prevention of preterm labor and the prolongation of pregnancy.<sup>5</sup> Also similar to the data from the United States, are those from South Dakota showing that approximately 4% of all infant deaths are attributable to injuries including child abuse. Together, SIDS, congenital anomalies, birth weight of less than 500 grams, and injuries make up over half (59%) of all causes of infant death in South Dakota.

### South Dakota and United States Causes of Childhood Deaths

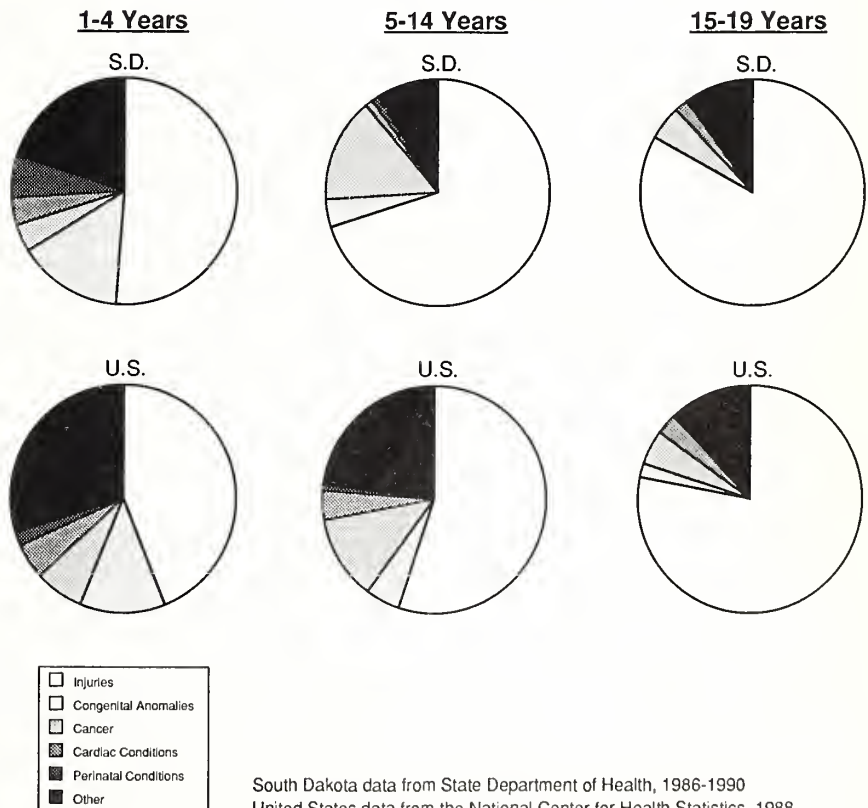


Figure 4



## CAUSES OF CHILDHOOD DEATHS

Rates of childhood deaths are presented in Table I. What is notable in these data is the observation that, with the exception of the 10 to 14 year olds, the rate of death for children in South Dakota is higher than that observed nationwide.<sup>8-13,15</sup> South Dakota's rate of death due to childhood injuries significantly contributes to this observation. Most striking are the patterns revealing the distribution of childhood deaths that are presented in the pie charts presented in Figure 4. These data clearly document how injuries contribute to the majority of deaths for children beyond the first year of life. In South Dakota this is true for 51% of children 1 to 4 years of age and for 70% of those between 5 and 14 years of age.<sup>8-12</sup> In South Dakota, injuries kill over six times as many 1 to 4 year olds and over four times as many 4 to 14 year olds than cancer and cardiac conditions combined. Even more striking, are data showing that 82% of all deaths of 15 to 19 year olds in South Dakota are related to injuries.<sup>15</sup> Also notable in each of these pie charts is how a higher percentage of childhood deaths are injury related for all age groups in South Dakota than is observed nationwide.

Data on rates of childhood deaths and injuries have profound implications for the prevention of injuries and needed medical care responsive to trauma. Various family background factors are also related to this very sad loss of life. Data from South Dakota show boys more than girls, and American Indians more than whites, are at increased risk of dying from an injury. The data in Table II show that boys become increasingly more vulnerable to fatal injuries as they become older and that American Indian children are at greater risk of dying of injury than are white children.<sup>16</sup> Interestingly, however, is the observation that the ratio of deaths of American Indians compared to white children declines as age increases. This is likely to reflect that compared to the older child, very young children are more vulnerable to socioeconomic factors that contribute to danger in the environment.

## TRANSPORTATION-RELATED INJURIES

Table III presents the specific nature of all childhood deaths due to injuries between the years of 1986-1990. Most apparent is the observation that transportation is the primary cause of death in childhood due to injury and accounts for almost half (47%) of all of these deaths. Annually, approximately 40 children in the state die of transportation related injuries.<sup>16</sup> Nationally, data from 1991 show that among children under 13 years of age, the rate of death of passenger vehicle occupants is 2.6 per 100,000 population with the highest rate among this group for infants under one year of age (3.5).<sup>17</sup>

Seemingly, in 1992 one would expect widespread public recognition of the value of wearing a seat belt while driving. South Dakota data on vehicle-related fatalities and injuries certainly document the importance of their use. Between 1987 and mid-November 1992, there were a total of 699 deaths of vehicle occupants in the state.<sup>18</sup> Data on the use of seat belts are available for 92% of these fatalities and they show that of those killed in South Dakota, 91% were not wearing a seat belt at the time of the crash. Data available on the 79 child occupants of vehicle crashes under the age

**Table II**  
Gender and Racial Ratios of Childhood Death Rates by Injury

| Age           | 1986 - 1990       |                             |
|---------------|-------------------|-----------------------------|
|               | South Dakota      |                             |
|               | Male-Female Ratio | American Indian-White Ratio |
| 0 - 4 years   | 1.14              | 5.14                        |
| 5 - 14 years  | 1.32              | 3.77                        |
| 15 - 19 years | 3.15              | 2.89                        |

Data from the South Dakota Department of Health

**Table III**  
Causes of Childhood Deaths Due to Injury

|                | 1986 - 1990  |    |              |    |               |    | Total |
|----------------|--------------|----|--------------|----|---------------|----|-------|
|                | South Dakota |    |              |    |               |    |       |
|                | 0 - 4 Years  |    | 5 - 14 Years |    | 15 - 19 Years |    |       |
|                | N            | %  | N            | %  | N             | %  |       |
| Transportation | 34           | 32 | 51           | 51 | 112           | 52 | 47    |
| Suicide        | -            | -  | 6            | 6  | 58            | 27 | 15    |
| Falls          | 2            | 2  | -            | -  | 1             | 1  | 1     |
| Homicide       | 15           | 14 | 5            | 5  | 10            | 5  | 7     |
| Fires/Burns    | 22           | 21 | 10           | 10 | 2             | 1  | 8     |
| Drowning       | 16           | 15 | 10           | 10 | 8             | 4  | 8     |
| Suffocation    | 8            | 8  | 4            | 4  | -             | -  | 3     |
| Poisoning      | 1            | 1  | 1            | 1  | 3             | 1  | 1     |
| Farm Machinery | 5            | 5  | -            | -  | 2             | 1  | 2     |
| Other          | 2            | 2  | 13           | 13 | 19            | 9  | 8     |

Data from the South Dakota Department of Health

of 18 who were killed in this same period of time show that 95% of them were not protected by either a safety seat or a seat belt.

Documenting the numbers of children killed in automobile crashes is just one way of examining the impact of such injuries upon the youngest citizens of the state. What also must be understood is that each death of an adult also represents the death of a parent that will profoundly affect the future of children who are left without a mother or a father. In South Dakota, approximately 50 citizens between the ages of 20 and 55 are killed annually while occupants in crashing automobiles.<sup>18</sup> The number of children so sadly touched by these deaths can be readily recognized.

While transportation fatalities primarily involve automobiles, injuries sustained while riding bicycles also contribute to death among children. Between the years of 1986 and 1991, eight children in South Dakota died of bicycle-related injuries.<sup>15</sup> Data available for seven of these deaths indicate that head injuries were likely involved in each of them. Data are unavailable regarding whether these children were wearing a helmet at the time of their fatal injuries that occurred in both urban and rural areas of the state. In 1991, the South Dakota Department of Transportation reported that among children under the age of 19, there were 112 bicycle-related injuries.<sup>19</sup>

**PREVENTION OF INJURIES DURING CHILDHOOD: SAFETY SEATS, SEAT BELTS AND HELMETS**

Injury prevention demands broad-based, culturally relevant educational approaches for children and for adults of all ages who interact with children. Examining the list of causes of fatal injuries presented in Table III highlights the importance of smoke detectors, fences around swimming pools, the avoidance of alcohol when driving, firearm precautions, childproof caps on substances harmful if ingested or inhaled, mental health, and a myriad of other precautions that should be taken to make the world a safer place for children.

As the largest percentage of fatal injuries during childhood are related to transportation,<sup>16</sup> the importance of child safety seats and seat belts is unquestionable. Data available on the ten children under 5 years of age killed in automobile crashes over the past six years show that only one was restrained.<sup>18</sup>

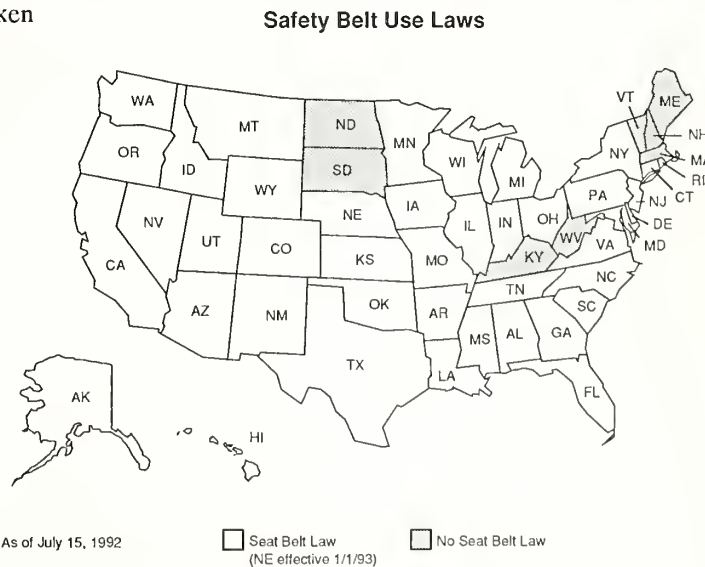
In July 1984, South Dakota law (SDCL 32-37) was enacted making it illegal for a child under the age of 2 years to be driven in an automobile without being restrained by a safety seat and between the ages of 2 and 5 years without a safety belt. Similar laws were passed by each of the 50 states between the years of 1978 and 1985.<sup>17</sup> Associated with the passage of these laws has been a national decrease in the rate of fatal injuries among child occupants of vehicles. Data from the National Highway Traffic Safety Administration document that the rate of deaths of infants and children under the age of 5 in 1990 is 55% of what

it was in 1975 and the fatality rate for children 5 to 15 years of age is currently 48% of what it was in 1975.<sup>20</sup>

Although these findings are impressive, it is important to recognize that there are variations in the 50 state child-restraint laws with states exempting specified populations of children, drivers, situations, and vehicles from such laws.<sup>17</sup> The ages of children covered range between from birth to 2 years (Mississippi) and from birth to 19 years (Maryland). Further, the 50 state laws vary in terms of who is held accountable for complying with them. In South Dakota, resident drivers, but not those licensed in other states, are responsible for children's use of proper safety equipment. South Dakota law also exempts use of car seats and seat belts if the child's personal needs are being attended to by someone other than the driver and if all seating positions equipped with child passenger restraint systems or seat belts are occupied. A national analysis conducted in the mid-1980s showed that 21% of all deaths of children under the age of 5 could occur to those exempted from various state child-restraint laws.<sup>21</sup>

Available data also show that approximately 17% of all infant passengers are held in an on-lap position that is legal in South Dakota if the child is receiving needed care. An examination of the dangers of such a practice has been conducted by analyzing emergency room findings from infant passengers involved in automobile crashes while being held in this position during travel.<sup>22</sup> Data from this study show that 58% of the held infants were injured. Had they been in a child safety seat, there would have been an estimated 30% reduction in injuries and a 69% reduction in intracranial injuries. Extrapolations from these data show that nationally, \$7.5 million could be saved in medical and long-term costs if infants under one year of age held "on-lap" were properly restrained in a car safety seat when they travel in a vehicle.

Currently South Dakota has a \$20 fine for failure to comply with the restraint laws for children under the



**Figure 5**



age of 5 years. Other state laws impose fines from \$10 (Alabama) to \$500 (Indiana).<sup>17</sup> South Dakota, however, does not have a law for seat belt use for children over 5 years of age or for adults. There have been six attempts to pass such a law since 1986 and each has failed with the latest defeat occurring in the 1992 legislative session with a 17 to 18 vote in the Senate. Reports of the debate on this bill highlight the arguments of its opponents who contend that seat belt use should be a matter of personal choice and that the state's efforts should focus on education regarding safety.<sup>23</sup> The map presented in Figure 5 shows that South Dakota and North Dakota are the only states west of the Mississippi River that do not currently have a seat belt law.

Findings from an observational survey conducted during the summer of 1992 of seat belt use by occupants of non-commercial vehicles show an overall 26% utilization of seat belts in South Dakota. More specifically, approximately 19% of men, 32% of women and 71% of the children were observed to be wearing seat belts. These data show a slightly lower usage rate than what is observed in North Dakota (30%) and in Nebraska (32%). Nebraska has a seat belt law that went into effect in January of 1993. Neighboring states with seat belt laws (Iowa, Wyoming, Minnesota, and Montana) have higher seat belt utilization rates ranging between 53 and 68%.<sup>18</sup>

Legislation requiring motorists to wear seat belts and motor cyclists to wear helmets will again be introduced in the 1993 state legislative session. A unique urgency will accompany this attempt as the federal Intermodal Surface Transportation Efficiency Act requires that states have such a law enacted by October 1993 or their construction money must be diverted to highway safety programs. This requirement means that if South Dakota does not pass a helmet and seat belt law in the upcoming legislative session, approximately \$8 million of construction funds for state, city, county, township, and other projects will be diverted to safety programs between 1994 and 1997.<sup>24</sup>

Use of helmets for motorcyclists has been a hotly debated issue for some time and this concern relates to teenagers as well as to adults. What is increasingly recognized, however, is the need for bicyclists and rollerbladers to wear helmets as well. Current estimates show that only 5% of all children nationwide wear helmets when they ride their bicycles.<sup>25</sup> South Dakota children are probably even less likely to wear helmets. While fatality data provide the clearest indication of the need for helmets, injuries sustained in bike crashes also clearly testify for their importance. Estimates show that nearly 400,000 children in the United States receive emergency treatment for bike-related injuries annually. Of those hospitalized, 70% sustain head trauma with estimates indicating a cost of \$4.5 million per serious head injury.<sup>25</sup> Further, of the 400 children who die of bicycle-related injuries annually, 75% had head injuries.

Wearing a bicycle helmet is effective in preventing injury.<sup>26</sup> A study of 235 cases of bicyclists with head injuries shows that safety helmets reduce the risk of

head injury by 85% and brain injury by 88%. More specifically, bike riders who do not wear helmets appear to be at a 6.6 fold greater risk of head injury and at an 8.3 fold greater risk of brain injury than riders who wear helmets.

## CONCLUDING COMMENTS

The prevention of childhood injuries may take many forms. Never to be forgotten is the powerful role of modeling behavior for children. When adults "buckle up" and wear bike helmets, they demonstrate expected behaviors that will more likely become a part of their children's habits as well. When car safety seats are used from the time a new baby leaves the hospital, infants and young children will feel secure in them and expect to be seated in them when riding in a car.

Survey data show that parents have a poor understanding of many issues related to childhood safety.<sup>27</sup> Of interest are the findings of one survey that show that far more parents are more worried about the likelihood of their child being kidnapped by strangers or becoming involved with drugs than about childhood injuries. This finding has been interpreted to indicate the success of media coverage on abductions and drugs in heightening parental responsiveness to these alarming dangers. These data, however, also show that while parents were well informed regarding the potential for automobile occupant injuries, they knew very little about pedestrian or bicycle injuries. The need for continued broad-based parent education on injury prevention is well documented in such findings.

The role of legal requirements of personal behavior is always hotly debated. Though the efficacy of safety measures may be flawlessly documented, to be effective, behaviors must change regardless of legal requirements. Community commitment to assuring universal access to car safety seats and bike helmets and encouragement of their use would clearly prevent damaging injuries and loss of life in childhood.

The South Dakota Chapter of the American Academy of Pediatrics is initiating a bike/roller blade helmet campaign and will be soliciting the support of other professional and civic organizations as this effort begins. Such a project will increase awareness of the importance of helmets and will facilitate their availability for all children.

With public and professional attention so readily focused upon highly technical and highly expensive medicine, what must not escape the vivid attention of all who provide care to children is the reality that injuries are the leading killer of our youngest citizens. It is very sobering to recognize that, in our era of modern medicine, a classroom of children (20 to 25) die annually in our state because they were not in a car safety seat or were not wearing a seat belt while riding or driving a car. Many more children's lives could be saved with inexpensive education and the demonstration of personal habits that model the importance of safe behavior in protecting a future.

## ACKNOWLEDGEMENTS

The author expresses appreciation for the helpful comments and suggestions made by Stephen Karl, MD as this manuscript was prepared.

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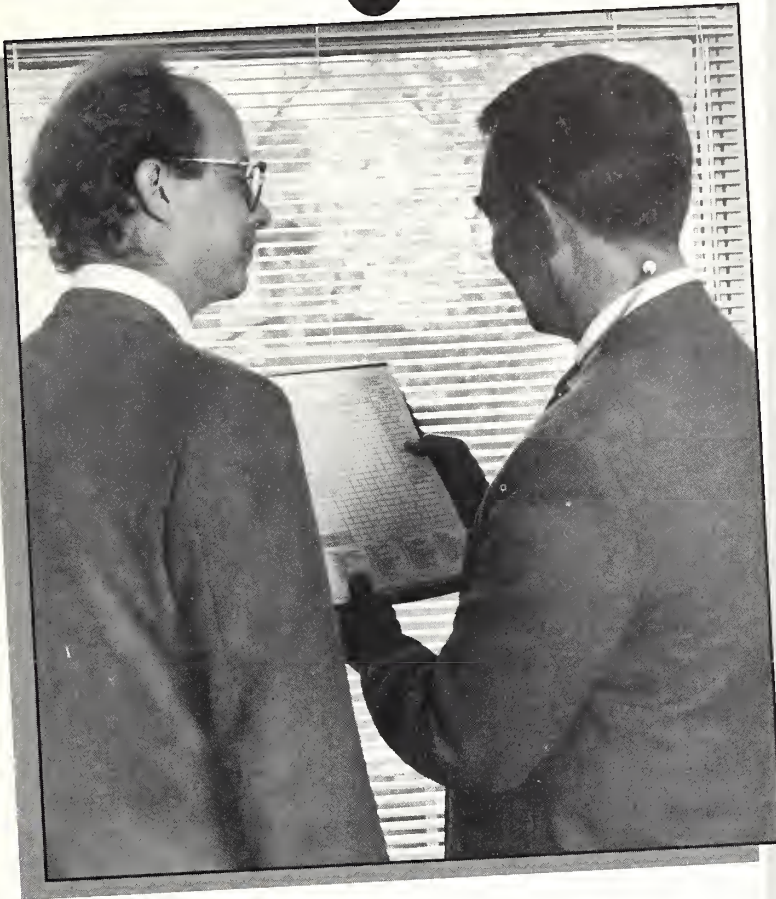
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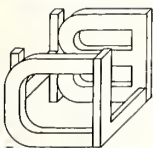
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## Systemic Effects of Ophthalmic Agents for the Treatment of Glaucoma

Jane Mort, Pharm.D, Brookings, SD

Glaucoma is typically managed with ophthalmic medications which include beta-blocking, sympathomimetic and cholinergic agents. Systemic complications of these agents are often not recognized as a consequence of their ophthalmic administration although the literature contains a significant number of studies and reports which validate the relationship. For example, ophthalmic administration of beta-blocking agents (e.g. timolol, betaxolol, levobunolol) may produce bradycardia, decreased cardiac conduction, reduced contractility, hypotension, exacerbation of asthma or chronic obstructive pulmonary disease, and mental status changes such as depression, fatigue, memory loss, and bizarre dreams. Sympathomimetics (e.g. epinephrine) may cause headaches, elevated blood pressure, increased heart rate, tremor and arrhythmias. Cholinergic agents (e.g. pilocarpine, carbachol, echothiophate iodide) may induce gastrointestinal disturbances, exacerbation of bronchial conditions, and neurologic alterations.<sup>1,2,6</sup>

If the characteristics of the ophthalmic administration site are carefully evaluated, the occurrence of the systemic effects mentioned above is not surprising. The application of medications to the eye offers direct access to the systemic circulation via the lacrimal ducts, nasal mucosa and veins which serve the area.<sup>2,4</sup>

Eighty percent of a fluid applied to the eye is removed via the nasolacrimal duct within 15-30 seconds.<sup>1</sup> This is supported further by studies in which ophthalmic administration of timolol produced significant plasma concentrations.<sup>5</sup> In addition, absorption via this route avoids the high first pass metabolism of the beta-blocking agents which may allow concentrations higher than those measured in the peripheral blood to reach organs such as the heart.<sup>1,2</sup>

Specific ophthalmic administration techniques reduce the amount of medication entering the systemic circulation. For example, Zimmerman et al found the timolol plasma concentrations were reduced by approximately 67% and 65% respectively when lacrimal occlusion or eyelid closure was employed.<sup>7</sup> Not only will this reduce side effects but the medication is retained well.<sup>3</sup> It should be pointed out that in this study, although lacrimal occlusion produced retention patterns similar to the combination of lacrimal occlusion and eyelid closure together, lacrimal occlusion alone led to overflow of tears and withdrawal of two of the six patients studied.

Systemic side effects necessitate that patients ad-

minister their ophthalmic medications correctly. The procedure for administration is as follows:

- (1) look at the ceiling,
- (2) grasp the lower lid beneath the eyelashes and move the lid away from the eye,
- (3) instill a drop of the medication into the pouch formed by the lower lid,
- (4) pause for a moment and look down,
- (5) gently lift the lower lid up until it comes into contact with the eye, and
- (6) close the eye for at least one to two minutes (lacrimal occlusion may be applied at this time).<sup>1,3</sup>

Utilization of the proper procedure for administration may help avoid or terminate systemic side effects.<sup>4</sup> Before managing a patient's new problem with the addition of a medication, consider the potential for an ophthalmic agent to be the source of the complaint and ensure correct administration techniques are being utilized.

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Edited by Brian Kaatz, Pharm.D.





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SDFMC suggests that when laboratory and other diagnostic studies are ordered, it remains the responsibility of the attending physician to obtain and address the results. SDFMC suggests that any laboratory or radiology services that are reported as definitely abnormal or reflect significant changes in a manner having potential adverse implications for the patient, should be addressed, evaluated, and appropriately acted upon. Pertinent **normal** laboratory studies should be acknowledged.

SDFMC suggests that if the attending physician is not going to respond in what would be considered a usual manner to an abnormal result, the rationale should be explained in the patient's record. Unexplained abnormal laboratory and radiology findings may suggest that the patient's physician was unaware of the patient's abnormal laboratory/x-ray findings. To avoid any unnecessary misunderstandings, SDFMC suggests that the progress notes and/or discharge summary clearly reflect the physician's impression of significant laboratory and radiology findings.

Gerald Tracy, MD  
Medical Director

# Council Meeting Highlights

The Council of the South Dakota State Medical Association met in Pierre on Friday, November 20, 1992. Highlights from this meeting include:

1. **NEW COUNCILORS SEATED** — Stephen Gehring, MD was seated as the second councilor from the Watertown District and Richard Holm, MD was seated as the second councilor from the Madison-Brookings District Medical Society.
2. **WORKERS' COMPENSATION** — In October the Commission on Medical Service met with representatives from the Industry and Commerce Association of South Dakota and following is their report which was approved by the Council.

## SUMMARY

### WORKERS' COMPENSATION DISCUSSION

On October 8, 1992, the following members of the Commission on Medical Service of the South Dakota State Medical Association (Drs Robert Harms, Henry Travers, Jerome Bentz, Jeffrey Hanson, Tad Jacobs, Robert Suurmeyer, Thomas Estes and R. Maclean Smith) met with Julie Johnson, president of the Industry and Commerce Association of South Dakota, and directors, Irvin Sterner, Tom Roby and Jack Rentschler, to identify problems with the workers' compensation program in South Dakota and to discuss possible solutions to those problems.

Problem areas identified include:

1. Frequently there is a question of who determines if an injury is work related. While the physician should not be the one making this determination, often times they are asked to do so.
2. Doctors may see and treat patients without knowing the injury is job related. There needs to be a mechanism for communicating to the physician prior to the time he/she sees a patient or as least at the beginning of the patient encounter, that the injury is job related.
3. Sometimes the physician recommends that a worker can return to work on a part time basis or on light-duty; however, the employer does not want or does not have work for the patient on that basis.
4. Physicians treating a workers' compensation injury need to talk with the employer or get a complete written explanation from the employer outlining the patient's job description and how the injury occurred.
5. The workers' compensation system needs to have a mechanism for re-evaluation of an injury; particularly in cases where there is no or limited substantiated medical evidence except for the patient's pain.

The following suggestions to alleviate these problems were discussed and agreed:

1. At the time of employment, the employer should get a signed release which would allow the physician to share information on workers' compensation cases with the employer. (Although South Dakota law does not require a signed release in workers' compensation cases; doctors are concerned about confidentiality and the physician/patient relationship, and a signed release would make this a more comfortable situation.) When a patient goes to a doctor for a work related injury the employer would have the patient give the doctor a copy of this signed release.
2. The employer, either personally or in writing, should provide complete information to the doctor about the patient's job description, the injury incurred and the type and availability of part time and/or light duty work.
3. In workers' compensation cases, the physician should treat the employer as an equal with the patient, not as an adversary and provide information to the employer on the patient's injury, treatment and prognosis. This could be accomplished by having the physician complete a brief form provided by the employer each time the workers' comp patient is seen.
4. At the time of or immediately following the first appointment with a workers' comp patient, the physician and employer should discuss and determine how information on the patient will be communicated with the employer.

This group recommended that a coalition of physicians, employers and insurers be established to continue to study and discuss problems relative to workers' compensation in South Dakota and to work toward resolutions which will be mutually beneficial. In addition, consideration will be given to employers/physicians making presentations at district medical society meetings, the annual meeting of the State Medical Association and other meetings of physicians and/or employers. Also, consideration will be given to publication of a brochure or paper outlining the responsibilities and needs of physicians and of employers as it relates to workers' compensation.

3. **MEDICAL-LEGAL COMMITTEE** — The Council approved a report from the Medical-Legal Committee which met for the first time in two years. The committee is developing a letter which will be sent to all doctors and attorneys explaining the deposition process and offering suggestions on how to carry out depositions with as little inconvenience as possible. They are also planning an



interprofessional program which will include both social and educational events.

4. **1993 LEGISLATIVE SESSION** — The 1993 session convenes on Tuesday, January 12, and continues through March 5, with March 22 and 23 for final action. SDSMA's legislative program and positions on anticipated bills are as follows:

**Sponsored —**

- 1) A bill to allow physicians to prescribe contraceptives to minors without parental consent (this would be compatible with federal regulations).

**Endorsed —**

- 1) Amendments to the Physician Assistant law as it pertains to their educational program.  
2) Allow for limited liability companies (this would allow tax advantages of a partnership and liability protection of a professional corporation).  
3) Tobacco, liquor and gambling tax increases and restrictions on sales and use.  
4) Require use of seat belts.  
5) Increased funding for Medicaid.

**Opposed —**

- 1) Allow chelation therapy for other than treatment of heavy metal poisoning.  
2) Amendments to the Pharmacy Practice Act (this would expand the pharmacists scope of practice).  
3) Radiologic technologist licensure as proposed. SDSMA would not oppose this if it is amended to provide for two levels of licensure.

5. **MINNESOTA HEALTH RIGHT ACT** — The Council authorized the SDSMA to join Wisconsin, Iowa and North Dakota along with the AMA in filing action to test the constitutionality of Minnesota's Health Right Act and allocated up to \$15,000 for this action. This act imposes state taxes on hospitals (beginning in 1993) and physicians (beginning in 1994) who treat Minnesota patients outside of Minnesota.
6. **MEDICARE PHYSICIAN ADVISORY COMMITTEE** — The Council approved SDSMA participation on this advisory committee provided certain safeguards are agreed upon by the carrier; such safeguards to include representation by the Denver Regional office and by South Dakota's senators and congressman.
7. **HONORARY LIFE MEMBERSHIP** — The following were elected to honorary life membership in the SDSMA:
- R. D. Bloemendaal - Rapid City  
Wenzel Kovarik, MD - Rapid City  
Richard Kovarik, MD - Rapid City  
H. Phil Gross, MD - California, formerly from Sioux Falls  
Robert R. Giebink, MD - Sioux Falls

The next Council meeting will be in Sioux Falls on Friday, April 16.

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The contact person at the Journal office is Jeri Spars, (605) 336-1965.



Ruth Parry, President, South Dakota State Medical Association Auxiliary

### Who Cares?

It is at this time of year, when the days are cold and short, the tinsel has faded, and the snow is deep that we are tempted to ask...WHO CARES? It is also as Valentine's Day approaches that we seek an opportunity to show certain people that they are cared about in a special way. Just as the traditions of St. Valentine have been followed for generations, the traditions of caring for one another have been established with our auxiliary.

We show that we care about the future of the medical profession by our continued commitment to AMA-ERF and our involvement in the legislative process. The support for medical education through AMA-ERF has been strong and vital. A new approach to this tradition has been a combination of AMA-ERF financial support with the Breakfast at the Capitol for the members of the legislature during the session.

This year, the annual breakfast will be held on Thursday, February 11. It will again be hosted by SDSMA Auxiliary members and physicians. The AMA-ERF donation is reflected on the invitation

which is mailed to all senators and representatives. Contributors of AMA-ERF are recognized on the invitation, thus underscoring our financial commitment to education and our professional interest in seeking legislative support for all medical and educational issues.

We also show that we care about others with our various health and educational projects around the state. District 1 has again hosted a successful Brownie Booth which raises funds for local health projects. District 9 has been involved with a community basketball game to benefit the local United Way. District 7 continues to provide volunteer drivers for a Meals on Wheels route. District 6 is again a key participant in the Invent America Fair with the Mitchell public school system.

Dozens of you are also involved as individuals because you care personally about a particular issue. One of these special persons is Karen Koob. As a breast cancer survivor, she has become involved with a volunteer Hot Line to provide information about problems confronting those who deal with breast disease. Trained volunteers who have survived breast cancer are available to give support and information. It is a goal of this group to become more accessible to all those in South Dakota who may need this service. I encourage you to dial 339-HELP and to give the number to all who might be interested.

Again, I ask WHO CARES? As I reflected on the special qualities of the South Dakota Medical Association Auxiliary, I know that WE CARE. We do care about our spouses, we do care about our families, we do care about our communities, and we do care about each other.



## Correspondence

Dear Dr Freeman:

I certainly enjoyed your editorial in the October, 1992 edition of the SOUTH DAKOTA JOURNAL OF MEDICINE. However, being of the old school, I feel that the Hippocratic Oath remains the benchmark, so to speak, in covering the ideals of medicine. Although the "Affirmation of the Physician" is understandably more in tune with the times, I find it somewhat puzzling that within an oath one needs to state, "compensation for my services will be fair and tempered by individual means."

Of course, we could argue, on infinitum, the definition of compensation, i.e. the personal reward of helping others versus monetary gains and, of course, the part stating "tempered by individual needs," I am certain, is meant to indicate the patient—at least I think so!

Have a fine day!

Richard I. Porter, MD  
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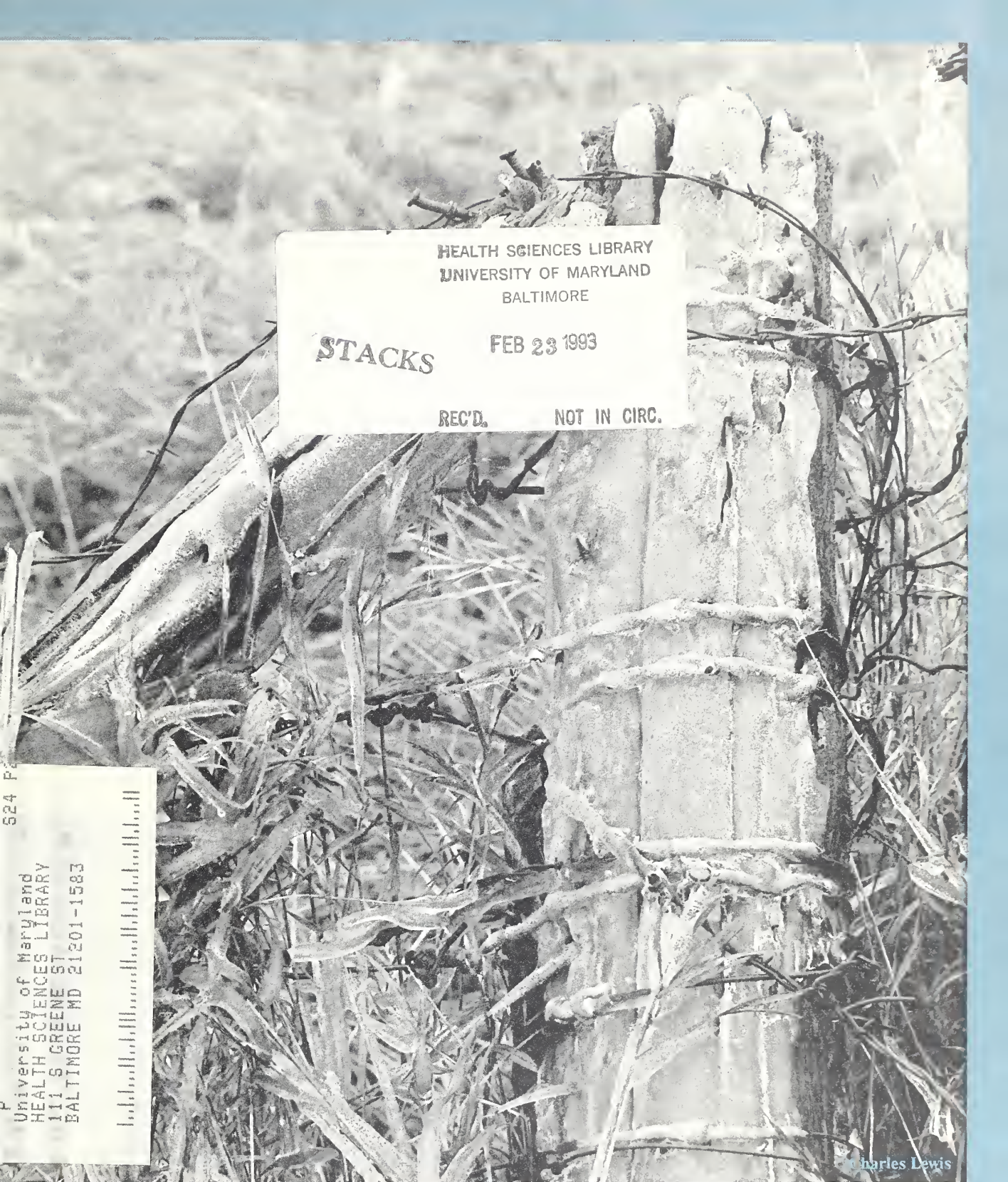
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Volume 46 Number 2

# JOURNAL OF MEDICINE

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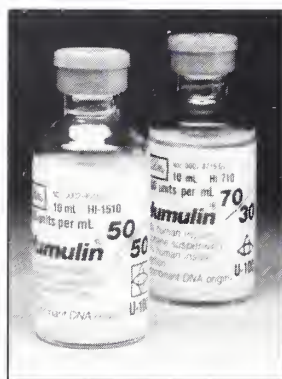




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Volume 46/No. 2 February 1993

(ISSN 0038-3317)

Official Publication of the  
South Dakota State Medical Association  
the South Dakota Chapter of the  
American College of Surgeons  
the South Dakota Psychiatric Association  
of the American Psychiatric Association

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**SOUTH DAKOTA JOURNAL OF MEDICINE** (ISSN 0038-3317) is published monthly by the South Dakota State Medical Association, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Subscription price: \$15 per year domestic, \$18 per year foreign, \$1.75 for single copy. Second class postage paid at Sioux Falls, South Dakota 57101 and additional mailing offices. POSTMASTER: Send address changes to **SOUTH DAKOTA JOURNAL OF MEDICINE**, 1323 South Minnesota Avenue, Sioux Falls, SD 57105.

**NATIONAL ADVERTISING:** Contact State Medical Journal Advertising Bureau, Inc, 711 South Boulevard, Oak Park, Illinois 60302. Phone: 708-383-8800.

**LOCAL AND CLASSIFIED ADS:** Contact Jeri Spars, **SOUTH DAKOTA JOURNAL OF MEDICINE**, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Phone: 605-336-1965.

**PRINTER:** The Ovid Bell Press, Inc, PO Box 370, Fulton, Missouri 65251-0370.

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## About the Cover

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**M. George Thompson, DO, President  
South Dakota State Medical Association**

**F**ar from being an animal activist, I feel there is a species that needs our attention. This species will never become extinct but their individual future depends, at least partially, on how we act or rather interact with them. The species to which I refer are known by many names but we older physicians have always called them drug salesmen.

Most of them work hard at their job of providing information about their product in a professional and friendly manner. Exchanging dialogue with them gives me a much broader base of understanding than reading advertisements and studying graphs. Some of them, especially those that have stayed with the same company for many years, have become very good friends.

I've asked a number of them to relate some of their experiences with physicians. A majority of the time they are quite satisfied, but all give examples of less than courteous treatment. Sometimes they are just ignored. Other times they are told things like, "I never see drug salesmen" or "Don't bother me unless I call you". It is my opinion that they have an important role to play as part of the medical community.

Their biggest complaint is that physicians, societies, clinics and hospitals who are the worst offenders, are often the first ones to ask for financial help to sponsor their programs and advertise in their journals. They are then "allowed" to exhibit in some out of the way corner.

Remember this is occurring only in some circumstances, but they feel it is becoming more prevalent. Let's try harder to give them a little more respect. After all this species has families, hobbies, news and other characteristics you may find beneficial. They may even become lifelong friends.



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### Thoughtful Restraint

All clinicians recognize and dread the possibility that one of their hospitalized patients may fall and sustain injury. In confused and combative patients, serious injury and even death can occur. With such patients, the issue of whether or not to use physical restraints is of much importance.

In addition to the morbidity that these patients can sustain, two other considerations are of relevance. One is, of course, the potential legal liability faced by nurses, physicians and institutions when a hospitalized patient sustains an injury such as a fall. A second major consideration has to do with the ethical ramifications that impact on this issue. From the standpoint of patient autonomy, it is important to allow patients to be in the least restrictive environment possible. In recent years, there has been much criticism of the overuse of physical, as well as chemical, restraints as a treatment for behavioral and cognitive problems. On the other hand, the caregiver's strong desire to protect patients from harm (nonmaleficence) frequently would seem to dictate to experienced physicians and nurses that restraints must be employed.

Recently, this topic was highlighted at a Neurosciences Grand Rounds. An effort was made to critically look at the problem of institutional injury, and to analyze when and how restraints should be used. At the conclusion of the session, a medical student rotating with me noted particular satisfaction with the session. In her judgment, the issue of restraints had previously fallen into the medical student's list of "things you never get taught".

Certainly, it is important to carefully identify those patients who are at risk of falling, or otherwise injuring themselves, and trying to intervene prospectively. Nursing staffs are probably better attuned to these problems and their prevention than are physicians, since nursing must deal with such patients on an uninterrupted basis throughout hospitalization. In addition, nursing seems to frequently bear the brunt of criticism when injury to a hospitalized patient occurs.

If restraints are employed, it is important that they be used correctly and effectively. Data suggests that a number of injuries occur to patients who have been restrained, but in an improper or insufficient fashion.

Clearly, it is important for nurses and physicians to attempt to explain to patients and families why restraints are deemed appropriate, and how they will be employed. Reactions from families can vary from agreement and support of such measures to marked disapproval and even hostility. If the need for possible restraint is explicitly discussed in advance with the involved parties, and if restraints are only used as long

as necessary, much of the controversy surrounding them can be ameliorated.

To heighten clinician awareness of this issue, I have asked Denise Boraas, RN to offer further observations in this issue's "Extenuating Circumstances" column. Ms Boraas has been actively involved in her institution's program for systematically analyzing hospital inpatients to determine who is at risk for falls, and what interventions should be taken. The program that she and her colleagues have been working on is standardized and relatively objective. If patients demonstrate a certain number of at-risk behaviors, consistent steps are taken. These may include the use of an observation room; arranging for family or other companions to stay with the patient; utilization of electronic warning devices to signal movement in a bed or chair which could lead to a fall; or the employment of various physical restraint devices.

It is always disconcerting to the hospital staff, physicians and visitors when a patient has to be physically restrained. Yet, I think virtually all clinicians would agree that there are times when such measures are truly needed to avoid harm to the patient. Indeed, it is essential for clinicians to be keenly attuned to their patients who are at risk for falling or otherwise injuring themselves. Close collaboration between physicians and the nursing staff can be very beneficial to these at-risk patients. Such recognition needs to be coupled with effective and compassionate communication with patients and families. When such measures are taken, the seemingly onerous burden of restricting a patient's freedom and mobility can, hopefully, be perceived as thoughtful and compassionate restraint.

Jerome W. Freeman, MD  
Editor

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# Prostaglandins: Viable Therapy In Gastric Ulceration

A. G. Janusz, BS; A. J. Janusz, MD, JD, FACS

## ABSTRACT

Gastric ulceration is a complex, multifaceted, pluricausal illness. The pathophysiology of gastric ulcer disease continues to be unclear. The mainstay for pharmacological management of gastric ulceration exists in reduction or neutralization of gastric acid secretion through administration of histamine H<sub>2</sub> receptor blockers such as cimetidine and ranitidine. Recent studies show however that the majority of patients experiencing gastric injury exhibit normal or below normal levels of HCl and pepsin secretion which leaves question to the effectiveness of acid reduction therapy. A viable alternative to H<sub>2</sub> receptor blockade is to prevent mucosal injury by maintaining the integrity of the mucosal barrier through administration of prostaglandin analogues. This cytoprotection may reduce gastric damage while maintaining normal acid secretion. Our purpose is to review prostaglandins as a potential therapeutic treatment of gastric and duodenal injury and explore the role of prostaglandins as natural physiological defense mechanisms against gastroduodenal mucosal damage. We also discuss several gastric mucosal damaging agents such as nonsteroidal anti-inflammatory drugs, alcohol, and stress along with comparisons of effectiveness between prostaglandin analogues and H<sub>2</sub> receptor blockers in reparation and prevention of injury caused by these agents.

Prostaglandins (PGs) are 20 carbon fatty acids synthesized by virtually every cell in the human body. Each cell has all the necessary components required for synthesis upon demand. That fact, and the local action and metabolism of these compounds are unique to PGs. Arachidonic Acid (AA) is the precursor for PG synthesis and can be metabolized via several pathways, including the cyclooxygenase pathway which leads to prostanoic acid synthesis, and the lipoxygenase route leading to leukotrienes. The human physiological role is wide and varied. Of particular interest is their possible role in an "adaptive cytoprotective" phenomenon in the gastroduodenal tract.

Gastric ulceration is a disease with pluricausal etiology but not yet fully understood. Over the last 20 years a vast amount of knowledge has been amassed, including Sir James Black's Nobel Prize for his work with histamine H<sub>2</sub> receptor blockade. It has been this advance which has led to the accepted drug management of gastric ulcer disease. Histamine H<sub>2</sub> receptors are responsible for gastric acid secretion. The effective blockade of these H<sub>2</sub> receptors (by use of cimetidine or ranitidine) results in a decrease in gastric acid secretion. Although H<sub>2</sub> blockers and neutralization therapy is the mainstay, the majority of patients show normal or below normal levels of HCl and pepsin.<sup>2</sup>

Our purpose is to review PGs as a potential therapeutic treatment of gastric and duodenal injury

and explore the role of PGs as natural physiological defense mechanism against gastroduodenal mucosal damage. In order to build a valid case for PG administration for mucosal damage defense, one must understand their physiological effect in the gastroduodenal tract along with the factors causing the ulceration. Three major contributors to the gastric ulcers are: aspirin (ASA) and nonsteroidal anti-inflammatory drugs (NSAIDs), stress, and alcohol.

Natural PGs and PG analogues stimulate mucus synthesis and secretion in humans. It is this mucus gel layer that contributes to the overall ability to protect the gastric mucosa. Exogenous PG analogues increase mucus viscosity thereby retarding acid and pepsin penetration, consequently, reducing their damaging effects.<sup>20</sup> Quadros and Wilson showed that upon decrease of mucosal PG synthesis stimulation, a corresponding increase in mucus secretion also decreased.<sup>21</sup>

A positive correlation was found between intraduodenal acid concentration and duodenal mucosal bicarbonate secretion in rats.<sup>22</sup> Pretreatment of indomethacin caused inhibition of PG synthesis and subsequent blunting of mucosal bicarbonate secretion in response to intraduodenal acid perfusion. This suggests a possible physiological relationship between PGs and bicarbonate secretion Isenberg found. The effect was reversed with addition of exogenous PGs and duodenal bicarbonate secretion was stimulated.<sup>23</sup>



Protection of the gastroduodenal mucosa is of prime importance in chronic use of non-steroidal anti-inflammatory drugs (NSAIDs)

### NSAIDs and ASA

Each year millions ingest aspirin for relief of pain. Along with ASAs, NSAIDs are prescribed for the treatment of osteoarthritis. Gastroduodenal mucosal damage as a result of treatment with NSAIDs is the most serious adverse effect of these compounds.<sup>3</sup> It is this adverse effect that has spurred vast amounts of research in the past decade. NSAIDs are damaging to gastric mucosa by a least two mechanisms. Its first mode of action is to inhibit cyclooxygenase (a PG mediator) thereby halting PG synthesis.<sup>2</sup> A side effect of this cyclooxygenase inhibition is a net increase in arachidonic acid (AA). The excess of AA will metabolize alternatively through the lipoxygenase pathway to produce leukotrienes.<sup>1</sup> Leukotrienes, in general, cause an inflammatory response and several studies indicate that these compounds increase mucosal injury.<sup>4,5</sup>

The second mechanism is called "ion trapping". NSAIDs remain a relatively neutral compound in high acidity. If acidity decreases NSAIDs will ionize and thus are water soluble thereby becoming trapped in the cell. A concentration gradient forms which favors movement of ions of weak organic acids (NSAIDs) into gastric mucosa. Alterations of cell permeability and cell damage occurs as hydrogen ions influx as sodium and potassium ions shift toward the gastric lumens.<sup>3</sup>

Cimetidine and ranitidine (H<sub>2</sub> receptor blockers) are generally ineffective in preventing damage to gastric mucosa caused by NSAIDs. Cimetidine to placebo were compared by Roth et al in preventing mucosal lesions in patients undergoing NSAID therapy. No difference in mucosal damage was observed.<sup>6</sup> Ranitidine also proved ineffective in preventing gastric ulcers in a study done by Tildesly et al.<sup>7</sup> Sucralfate had shown promise as a gastric mucosal protectant but later proved to be ineffective over a two week period.<sup>8</sup>

Two PG analogues, misoprostil and enprostil, prevented or significantly reduced gastroduodenal injury caused by ASA.<sup>9-11</sup> Lanza and colleagues compared cimetidine to misoprostil in preventing gastric mucosal injury.<sup>12</sup> Misoprostil also proved to be far superior to sucralfate in preventing ASA induced injury.<sup>13</sup> Misoprostil was also studied over a twelve week period in patients with osteoarthritis under treatment with proxicam, naproxin, or ibuprofen. It was administered in doses of 100 or 200 micrograms q.i.d. Placebo prevented gastric mucosal damage 78% of the time as compared to 94% and 99% prevention with misoprostil respectively.

### STRESS

As eluded to earlier, patients experiencing gastroduodenal ulcers showed normal or below normal levels of gastric acid. A deficiency of PGs in mucosal tissue was also noted. Research studies have shown

high amounts of cortisol production in patients under stress. Cortisol, a corticosteroid, is a potent inhibitor of AA secretion thereby stunting PG production.<sup>3</sup>

An important factor in maintaining mucosal integrity is gastric mucosal blood flow.<sup>1</sup> Mucosal blood flow reduction causes the mucosa to be more susceptible to damage from endogenous and exogenous irritants. PGs are known to increase and maintain mucosal blood flow, even under conditions of inhibition of acid secretion.<sup>24</sup> Tarnowski et al indicated that PGs limited the depth of damage caused by mucosal blood flow reduction primarily to the superficial epithelium thereby protecting the deeper vascular portions of mucosa and allowing a more rapid restoration of the superficial epithelium from the intact deeper cells.<sup>25</sup>

### ETHANOL (ALCOHOL)

Ethanol-induced gastric mucosal injury reveals areas of focal hyperemia and hemorrhage in the damaged portions of the stomach. This observation suggests that impaired blood flow plays a role in the genesis of ethanol-induced lesions.<sup>14</sup> Experiments carried out by Szabo suggest that intragastric ethanol administration produced a marked increase in vascular permeability and damage within one to three minutes.<sup>15</sup> Trier et al suggested, after revealing that both vascular leakage and damage occurred prior to hemorrhagic lesions, that markers of vascular injury are important early pathogenetic indicators of subsequent gastric lesions.<sup>16</sup> Mucosal vascular damage caused by ethanol occurred later with maximal damage in capillaries near the luminal surface. Deeper muscular mucosa showed no damage. Pretreatment with PGs reduced vascular damage near luminal surface however, did not abolish it. Functional studies suggested that PGs given in cytoprotective doses prevented early vascular stasis and consequently, gastric lesions induced by ethanol.<sup>17</sup>

Data further suggesting PGs protective action by maintaining gastric blood flow was demonstrated by Guth. He observed rapid and complete cessation of blood flow to areas of mucosal injury as a result of ethanol administration. Synthetic PGs in cytoprotective doses, prevented impaired blood flow, hemorrhage, and gastric lesions induced by ethanol.<sup>18</sup>

### CONCLUSIONS

Prostaglandins stimulate several defense mechanisms for gastroduodenal protection, including mucus and bicarbonate secretion, gastric blood flow, and cell regeneration. Decreased levels of mucosal PGs which may occur during NSAID treatment, alcohol use, or stress, increases the probability of damage to the mucosa. Chronic use of NSAIDs and/or alcohol leads to actual ulceration. PG analogues may provide promising therapy in ulcer disease caused by insufficient levels of natural PGs in mucosa while traditional methods of ulcer management such as H<sub>2</sub> receptor blockers prove less effective in anti-ulcer therapy. The one known side effect of PG analogue administration

in the gastrointestinal tract (diarrhea) can be reversed by dose reduction.<sup>19</sup> Although antral mucosal hyperplasia was observed by Peled in neonates treated with PGs for ductus arteriosus management, the problem had not been observed in adults.<sup>19</sup> While additional study is needed in order to unequivocally determine PGs superiority over H<sub>2</sub> receptor blockers or neutralization for ulcer management, exogenous PG analogues may provide a unique and effective treatment.

## AUTHORS

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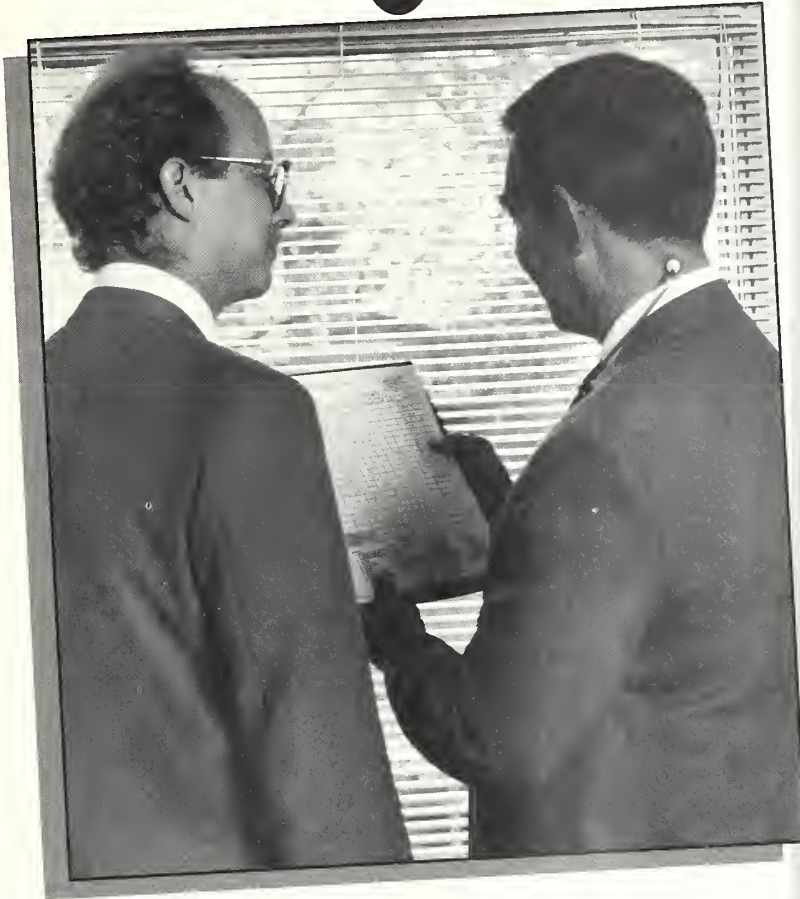
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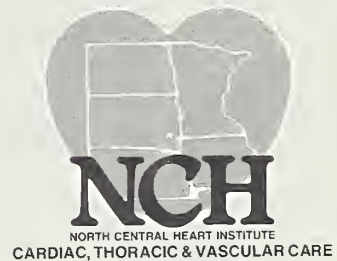
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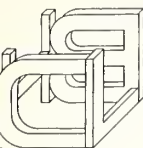
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# Assessing Extracranial Carotid Stenosis: Magnetic Resonance Angiography, Duplex Scanning, and Digital Angiography

Jerome Freeman, MD; Thomas Free, DO; Harlan Payne, MD; Leonard Gutnik, MD; Gregory Schultz, MD; Thomas Masterson, MD; Marshall Brewer, MD

## ABSTRACT

Recent data have demonstrated the efficacy of carotid endarterectomy in patients with severe, symptomatic carotid stenosis. In this context, our study analyzes the role of carotid testing with magnetic resonance angiography and carotid duplex scanning, as compared to arterial digital subtraction angiography.

Stroke is the third leading cause of death in this country and a major cause of chronic morbidity. Much effort is devoted to trying to prevent stroke in at-risk patients. A major cause of thromboembolic stroke is atherosclerotic narrowing and ulceration in the region of the carotid bifurcation. Thus, much emphasis has been placed on carotid endarterectomy as a mechanism for reducing stroke risk. In the past year, three studies<sup>1-3</sup> have demonstrated that carotid endarterectomy is highly beneficial to patients with recent hemisphere ischemia and ipsilateral high grade carotid stenosis (>70% linear diameter loss). These studies were prospective, randomized, multicenter trials.

Our present study grew out of a concern for the best way to evaluate symptomatic patients with apparent severe extracranial stenosis. Traditionally, angiography has been the definitive way to study the carotid arteries. In recent years, carotid artery duplex scanning has become more accurate, and magnetic resonance angiography (MRA) is also being employed. Both of these latter techniques are non-invasive. No injection of contrast material is required to generate the MRA vascular images. Occasionally, physicians are faced with symptomatic patients who seem to be at particular risk for arterial angiography. Such factors could include severe generalized atherosclerotic disease in the extremities making access for angiography technically difficult; known severe atherosclerotic disease in the aorta making catheterization more risky; uremia; and advanced age. In such patients, we felt that occasionally it might be more prudent to establish the diagnosis of

severe extracranial stenosis non-invasively (i.e. with duplex scanning and magnetic resonance angiography) and proceed to endarterectomy, rather than to obtain angiography prior to surgery. In an effort to analyze this possibility, this study was designed to ascertain the relative accuracy of the three modalities for studying the extracranial carotid circulation.

## METHODS

The patients for this study were chosen from the clinical practices of the authors. Patients with carotid disease, who had undergone carotid duplex scanning and were scheduled for arterial digital subtraction angiography (DSA), were asked to enroll in the study by agreeing to also have magnetic resonance angiography. This study was approved by the Institutional Review Committee of the involved hospital. An informed consent procedure was used which explained the nature of the study and obtained signed consent from the participants. Eighteen patients were initially enrolled. In one patient, the magnetic resonance angiography was felt to be non-diagnostic (due to patient motion artifact) and the patient was not included in subsequent analyses. In a second patient, digital angiography and magnetic resonance angiography were both obtained and compared, but no duplex scanning was obtained. Thus this latter patient was not part of the analysis which looked at the accuracy of duplex scanning (DS) as compared to MRA/DSA.

This study had two principal components. First, in a blinded fashion, three radiologists compared the DSAs



and MRAs of the enrolled patients. In a second portion of the study, the duplex scanning data was blinded and given to a vascular specialist other than the individual who had initially made the interpretation for analysis. Thereafter, a comparison was made between the three modalities - DSA, MRA and DS.

With respect to the first portion of the study, eighteen patients were studied for a total of 36 common carotid bifurcations. Each patient first had a two dimensional time of flight magnetic resonance angiogram of the common carotid bifurcations performed. The patient then underwent digital subtraction angiography of the common carotid bifurcation. The digital subtraction exams were obtained with multiple projections to obtain the greatest degree of narrowing. The examinations were then reviewed by three independent radiologists. The magnetic resonance angiograms were evaluated first. At a later time, the digital subtraction angiograms were evaluated. The examinations were assessed for diagnostic quality. In addition, the proximal internal carotid arteries were evaluated for the degree of stenosis. The categories of diameter stenosis were as follows: normal, less than 30%, 30% - 69%, 70% - 99%, and total occlusion. The presence of ulceration was also commented on. The magnetic resonance angiography was compared to the digital subtraction angiography for diagnostic quality.

The method for assessing the duplex scanning studies was somewhat different. The initial dictated report was used and compared to a blinded interpretation done by another physician. Unlike the angiography, where specific diagnostic categories were used, the duplex analyses were done without any specific diagnostic guidelines. Generally, the terms used for these interpretations were comparable to those used in angiography—i.e. normal, mild, moderate, and severe disease (or occlusion).

## RESULTS

A summary is provided of the comparison between the digital subtraction angiograms and the magnetic resonance angiograms. The former were considered to be the more definitive modality. As noted above, the magnetic resonance angiography on one patient was non-diagnostic because of considerable motion artifact. All of the digital subtraction angiograms were diagnostic. It should be noted that this study employs a small sample size and that the data to be described has not been subjected to statistical analysis.

For radiologist A, digital subtraction angiography and magnetic resonance angiography concurred 88% of the time. The discordant cases differed by one category of stenosis. Ulceration was seen on DSA in eight carotids. In one of the carotids, the ulceration was also thought to be present on magnetic resonance angiography. Magnetic resonance angiography was falsely positive in two cases in which digital subtraction angiography did not demonstrate the ulceration.

For radiologist B, digital subtraction angiography and magnetic resonance angiography concurred 79% of the time. Six of the carotids differed by one category of stenosis. One carotid differed by two categories of stenosis. The carotid that differed by two categories appeared in retrospect to be secondary to mistaking the external carotid artery for the internal carotid artery. Ulceration was seen on digital subtraction angiography in five cases. Of these five cases, magnetic resonance angiography suggested ulceration in two cases. In two cases, magnetic resonance angiography was falsely positive, suggesting ulcerations not verified on the DSA exam.

For radiologist C, digital subtraction angiography and magnetic resonance angiography concurred 70% of the time. In all ten discordant cases, magnetic resonance angiography differed from digital subtraction angiography by one category of stenosis. Ulceration was seen on digital subtraction angiography in five cases. In these five cases, magnetic resonance angiography demonstrated ulceration in one of the cases. Magnetic resonance angiography was falsely positive in two cases in which digital subtraction angiography did not demonstrate ulceration.

For all three evaluators, the overall accuracy of magnetic resonance angiography compared to digital subtraction angiography was 79%. (See figure 1)

As discussed in the methods section, each duplex study was interpreted by two individuals. Thirty-one vessels were studied. When the two interpretations for each vessel were compared, it was felt that they were in substantial agreement in 29 instances (93.5%). There were two instances of disagreement, with lesions being described as "moderate" versus "severe". Thus, 6.5% of the time there was a difference of one grade in physician interpretation. (See figure 2)

Thereafter, a comparison was made of the three modalities: DSA, MRA and DS. Only those patients who had testing by all three modalities were included in this analysis. There was substantial agreement be-

| Comparison of MRA to DSA<br>*(36 Carotids) |         |                              |                    |
|--|---------|------------------------------|--------------------|
| Radiologist                                | % Agree | Actual No. Pts. Disagreement | Max Grade Disagree |
| A  | 88      | 1                            | 1                  |
| B  | 79      | 6                            | 1                  |
| C  | 70      | 10                           | 1                  |
| Average                                    | 79      | 5.9                          | 1                  |

Figure 1

| Carotid Duplex Comparisons<br>*(31 Carotids) |                             |
|--|-----------------------------|
| Agree  | 93.5%                       |
| Disagree                                     | 6.5% (Max Grade Disagree 1) |

Figure 2

tween all three modalities in 24 instances (77%). For this level of agreement, the three blinded radiologists had to be in concurrence, and the DS had to concur with the DSA/MRA interpretations. In six patients, there was some combination of variability in these findings. In four of these patients, the DS was interpreted as being mild or mild-moderate, and the majority of the radiologists felt there was more severe disease by one grade. It should be noted that in this category, there were some significant differences in the radiologists' interpretations which necessitated discordance when comparing the DSA and MRA to DS. For instance, in one patient, radiologist A judged a stenosis to be in the moderate category by both DSA and MRA; a second radiologist judged both modalities to show severe stenosis; and a third radiologist felt the MRA showed moderate disease and the DSA severe disease. In retrospect, the radiologists felt some frustration with the grading system used in this study. It was their consensus that many of the patients had vascular narrowing in the 69% - 70% range, making it difficult to assign stenosis to the 30% - 69% group versus the 70% - 99% group.

In one instance, a duplex scan impression was felt to vary by two grades from the combination of the DSA/MRA data. In this instance, the vessel was interpreted as showing mild disease by DS, and the MRA/DSA were interpreted as showing severe disease. Thus, discordance of two grades between the doppler results and the MRA/DSA results occurred 3% of the time. (See figure 3)

| Comparison MRA + DSA + Duplex<br>*(31 Carotids) |               |
|---|---------------|
| Grade<br>Variation                              | %<br>Carotids |
| 0   | 77 (24/31)    |
| 1   | 19 (6/31)     |
| 2   | 3 (1/31)      |

Figure 3

DISCUSSION

Arterial angiography — either DSA or traditional cut film single vessel catheterization — continues to be considered the "gold standard" for assessing extracranial carotid disease. Because of the morbidity that can attend angiography, especially in high-risk patients, there has been much emphasis on seeking non-invasive methods for establishing carotid disease. In this paper, it has been our intention to focus primarily on the accuracy of two non-invasive techniques for detecting high-grade extracranial stenosis.

Ross et al have suggested that MRA tends to overestimate the degree of stenosis.<sup>4</sup> Riles et al compared MRA, conventional angiography and DS. They found that duplex scans correlated better with conventional angiography (65%) than did MRA studies (52%). Their study suggested that both MRA and duplex scan-

ning tended to overestimate the degree of stenosis.<sup>5</sup> Other studies have suggested that duplex scanning compares fairly well with angiography.<sup>6,7</sup>

One difficulty when analyzing DSA or MRA is that it is not always apparent whether interpreters are talking about diameter stenosis or area stenosis. The two terms are not interchangeable. Most typically, angiography is interpreted in terms of diameter reduction, and this was the case in the three recent studies which suggested the efficacy of endarterectomy in patients with a greater than 70% lesion.<sup>1-3</sup> The estimated diameter reduction is less than the area reduction. For instance, a 50% diameter reduction corresponds to approximately 75% area reduction and can be hemodynamically significant in terms of stenosis. A 60% diameter reduction can correlate with a 90% area reduction. Presumably, one of the reasons that duplex scanning can prove to be so accurate is that it takes into account the velocity of blood flow through a stenosis, and is thus a reflection of area stenosis as opposed to just diameter reduction. In this regard, it should be stressed that the studies to date which demonstrate the efficacy of endarterectomy in symptomatic patients are all based on diameter reduction rather than area stenosis.<sup>1-3</sup> While it is a logical presumption that assessing the area of reduction may prove to be the most accurate way to assess vessel pathology, this needs to be verified by future studies.

In our study, in addition to making an overall comparison of DSA, MRA, and DS, we specifically focused on how well the non-invasive studies did in the patient with high-grade extracranial stenosis. More specifically, we had asked the question: are there times in a symptomatic patient, when both non-invasive studies suggest a high-grade carotid lesion, that patients can proceed to endarterectomy without arterial angiography? In asking the question in this fashion, we are presuming that if the non-invasive data does not agree, or if it suggests mild to moderate disease, angiographic confirmation is advisable before proceeding to surgery.

In our patient series, there was good agreement between DSA, MRA and DS 77% of the time. That is, the three radiologists who read the DSA/MRA studies and the two vascular specialists who read the DS were in substantial agreement in about three fourths of the patients studied. In the remaining patients, the degree of discrepancy was generally one grade. The exception to this is the patient in whom the duplex scanning suggested mild disease in a vessel and the MRA and DSA suggested severe disease.

Our data suggests that these patients can be assessed with non-invasive techniques, and that it is very unusual for the two non-invasive modalities (DS and MRA) to suggest more severe disease than a DSA confirms. In one patient in whom the duplex scan suggested severe stenosis, there was major disagreement among the radiologists regarding the DSA/MRA. One rated both as severe, one rated both as mild, and one interpreted the DSA as mild and the MRA as showing severe



stenosis. Thus, in this patient, if the DS had been paired with the MRA interpretation suggesting severe disease, the actual pathology in the vessel may have been overestimated. In the other five instances in which there was a one grade difference between a combination of DSA, MRA and DS results, the duplex scan actually suggested milder disease than the other two studies.

It should be noted that duplex scanning is highly technician dependent. Considerable variability exists between laboratories, and it is important for each laboratory to have on-going quality assurance to verify its accuracy as compared to angiography.

Based on the data we have obtained, it is our opinion that in occasional, carefully selected patients, it is reasonable to proceed to endarterectomy using the combination of the DS and MRA. If this is done, it is certainly important that the patient's symptoms of cerebral ischemia correlate well with the stenotic vessel. It is also obviously important that both the DS and the MRA are in agreement that a severe stenosis exists. If there is a discrepancy between these two modalities, and if the patient is judged to be a potential surgical candidate, proceeding to angiography would generally be advisable.

This study was developed and coordinated by the Department of Neurosciences, USD School of Medicine, with support from Sioux Valley Hospital.

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## Choices: Options or Limitations

A recent accident has caused me to modify my life style as my activity is limited to the mobility afforded by crutches. It has been my past practice to be very self-sufficient and I have always enjoyed being a care-giver and nurturer to others. I am faced with choices; some are options, others are limitations.

The abrupt change to being extremely dependent on others has caused some frustrations and a great deal of introspective analysis. In fact, as I began a recent day, I actually placed my crutches against the wall, planning to pick up my coat and gloves from the closet down the hall before quickly leaving the house. I was forced to laugh aloud, realizing that I was not moving anywhere without assistance and then could only move slowly. Yet, I was relieved to be mobile at all.

Although I have always prided myself on establishing priorities, I now realize that I have still kept a LONG list, one which is now considerably shorter. Many items which have seemed to be so significant can easily be accomplished by others and some have been completely dismissed. Those things which I still feel determined to do are even more significant to me because I have more time invested. However, the impact to others is virtually the same regardless of the option I chose.

Perhaps I can encourage each of you to check your list of priorities. Can the list be shortened? Can you assign the responsibility for some of the items to someone else? Are there items on your list that really have no significance at all? Will the impact to others be affected by a change in your priority listing?

I am learning that dependence on others is necessary, but it still is not comfortable. The acceptance of the assistance which has been offered to me has provided me with options. That choice means that the limitations are few.

Physicians are frequently placed in a position of having to make choices: for themselves, for their families, and for their patients. Some modification may be required for you to mutually meet your own needs as well as those of others. Establish your priorities now so that the choice you make can truly be an option rather than a limitation.

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## The Transdermal Route of Drug Administration

James E. Powers, Pharm.D.  
Brookings, SD

The transdermal route of administration refers to drug systems applied to the skin for the purpose of eliciting systemic pharmacological responses. Drugs used in these systems include pilocarpine, scopolamine, nitroglycerin, clonidine, estradiol, fentanyl, nicotine and soon testosterone.

The most important advantage of transdermal systems is being able to achieve and maintain constant steady state drug serum concentrations over long periods of time (hours to days). This in turn avoids adverse drug reactions caused by variations in peak-trough drug serum concentrations as seen with oral pharmaceuticals which are not sustained release or which have short half lives. Other advantages of transdermal systems include improved patient compliance, avoidance of the first pass liver metabolism effect, and circumventing the vagaries of gastrointestinal tract actions. Transdermal systems are an excellent method of delivering drugs with short half lives, with rapid termination of drug action possible by removal of the transdermal system.

Disadvantages of transdermal systems include the possibility of allergic skin response to adhesive or drug, drugs of high molecular weight cannot be used, they cannot be used in acute situations, the patient may not like the patch for cosmetic reasons, and the cost is somewhat higher than oral preparations.

The function of the transdermal delivery system is complex and dependent upon active migration of the drug from the transdermal system to the outer layer of the skin, the stratum corneum, penetration through the stratum corneum to the viable dermis with subsequent absorption to produce a systemic effect. The amount of drug presented for systemic circulation is dependent on drug concentration at the skin surface, concentration of drug in a lipid and aqueous phase after equilibrium has occurred in the skin, the molecular size (a large drug molecule will produce more frictional resistance to movement), and skin thickness. There are a number of other factors which can affect penetration of drug through the skin—such as site of system or patch application, skin condition at application site, and hydration state of skin.

There are three basic transdermal drug delivery systems. They are the partition system, matrix-diffusion system and membrane-permeation system. The matrix and membrane systems are the most commonly used transdermal drug delivery systems. The membrane

controlled release system contains drug in solution or suspended as a gel in a reservoir. A protective peel strip is removed before application and functions to protect the adhesive layer. The adhesive layer maintains dosage form contact with the skin while the membrane layer controls the release rate of the drug. The drug reservoir serves as the source of the drug and the backing layer prevents physical loss of drug from the system and provides an occlusive layer which facilitates percutaneous absorption and protects the system from moisture. The matrix controlled release system is fundamentally the same design. The major difference is that the drug reservoir has drug suspended in a matrix which controls the release rate.

Instructions to the patient on how to use and dispose of the product are very important. Each transdermal drug system has a specific body site for application—e.g. behind ear, chest, arm or buttocks. The old patch or system should be removed before application of new system. The patient also should know how often to apply a new patch (hours or days) and that the site should be moved a bit with each new application to minimize irritation. Application of all systems should be to areas with no cuts or abrasions (intact skin). When the patch is removed it should be folded on the adhesive edges to seal the system and disposed of by flushing down the toilet or otherwise out of harms way—especially if children are present.

In conclusion, the transdermal route of drug administration is a popular route for the treatment of motion sickness, angina, menopause symptoms and osteoporosis, pain control, hypertension and smoking cessation. Transdermal systems using other drugs are in the pharmaceutical pipeline and will soon be available.

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Edited by Brian Kaatz, Pharm.D.





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## Extenuating Circumstances

### Fall Prevention: A Challenge to the Health Care Team

One of the greatest challenges facing physicians and nurses today is fall prevention of their patients. Oftentimes a patient will fall without any advanced warning. Others may have presented with fall risk potential that wasn't immediately identified. Nurses, in particular, need a better way to identify hidden potential so they can act on it and prevent falls.

While falls can happen to all kinds of patients, neurologically impaired patients are at particular risk. Therefore, it was felt that we needed to develop a method to focus on those patients who have an immediate risk of potential for a fall. At our institution, the nursing Neurology Director along with the unit Quality Assurance Council put together a fall prevention program that facilitates that purpose.

A fall prevention checklist was developed by using a literature search on this subject along with examples of similar types of fall prevention programs. The checklist is used to give patients a score that is based on gender, age, history of falls, types of medications being taken, orientation, and orthostatic blood pressure changes. The patient's score puts him or her into one of several fall prevention categories ranging from no risk to high risk.

The "potential for injury" nursing care plan covers the various actions the nurse should take to prevent a patient from falling. This care plan incorporates the different categories with actions pertinent to each. Some interventions/preventions include side rails in an upright position, bright stickers on name bands and charts to warn all staff of fall potential, and an observation room placement. Other actions might be a Geriatric Assessment Team evaluation, the use of restraints (from least restrictive to more restrictive), an electronic bed movement alarm, or the need for a constant attendant (e.g. family or nursing staff). The implemented care plan gives that patient's family and caregivers a day to day plan of action to prevent a fall.

The fall prevention checklist is completed on admission and the patient's score influences care plan actions. When implementing the care plan, we discuss the necessary actions with the patient and family. We also provide them with an information sheet regarding the possible use of restraints if we see that as a need. The collaboration between the patient, nurses, physicians and family members enhances the effectiveness of the program.

Fall prevention will always be a challenge for the health care team. While prospective intervention does not eliminate falls, it can certainly help reduce the

incidence of them. A formal fall prevention program can heighten the awareness of the nursing staff and physicians to this problem, and can help provide definitive strategies for fall prevention.

Denise Boraas RN  
Neurology QA Council Chairman  
Sioux Valley Hospital  
Sioux Falls, SD

---

### *When The Time Comes*

*Jerry Bowman, Sioux Falls*

*To treat or not to treat  
That is the question.*

*Trees are killed.  
Ink is spilled.  
We seek timely moral answers  
As if it were as simple as plucking  
From Column A and matching with Column B.*

*When the time comes I want in my corner  
A doctor who when playing free association with the  
word Dylan  
Responds Bob, Thomas and 90210.*

*When the time comes I want in my corner  
A doctor who is like a cut man who knows how to stop  
the bleeding and  
Reduce the facial swelling brought on by repeated  
punches and jabs;  
Who does his best to get me ready for the 13th round;  
Who has the courage to throw in the heavily-laden  
white towel  
Before the bell signals the 15th round;  
Who, having made the fateful decision, can weep with  
me  
If there is any emotion remaining  
And who is my trusted friend.*

*When the time comes I want in my corner  
A doctor who knows that sometimes the answer is no,  
and who has sleepless nights because of it.*

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#### AUTHOR

Jerry Bowman, Sioux Falls, SD, wrote this poem in response to issues raised at an Augustana College Masters Seminar dealing with ethics and health care.



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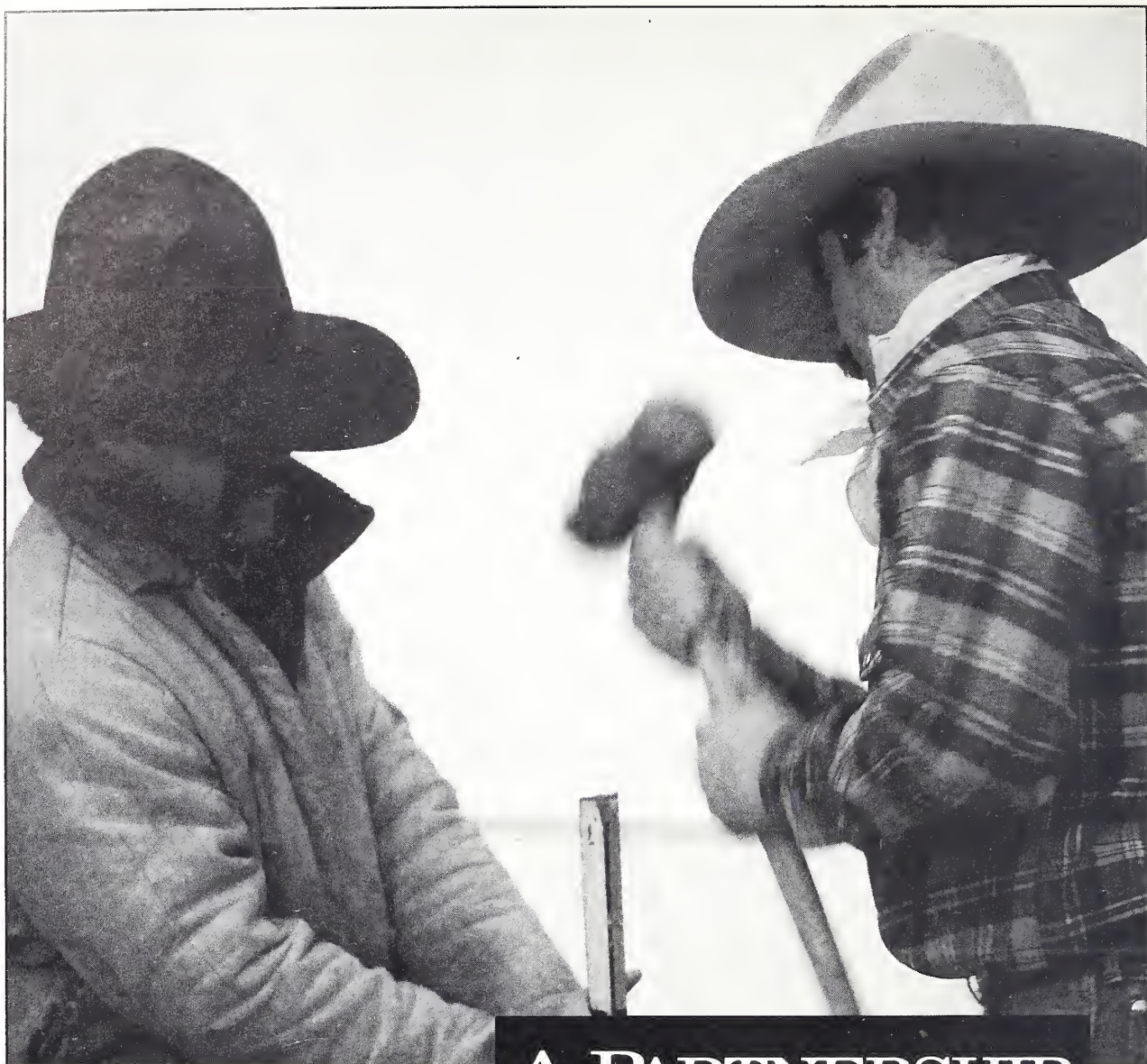
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Volume 46/No. 3 March 1993

(ISSN 0038-3317)

Official Publication of the  
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the South Dakota Chapter of the  
American College of Surgeons

the South Dakota Psychiatric Association  
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SOUTH DAKOTA JOURNAL OF  
MEDICINE (ISSN 0038-3317) is published  
monthly by the South Dakota State Medical  
Association, 1323 South Minnesota Avenue,  
Sioux Falls, SD 57105. Subscription price: \$15  
per year domestic, \$18 per year foreign, \$1.75  
for single copy. Second class postage paid at  
Sioux Falls, South Dakota 57101 and addition-  
al mailing offices. POSTMASTER: Send ad-  
dress changes to SOUTH DAKOTA  
JOURNAL OF MEDICINE, 1323 South  
Minnesota Avenue, Sioux Falls, SD 57105.

NATIONAL ADVERTISING: Contact State  
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PRINTER: The Ovid Bell Press, Inc, PO Box  
370, Fulton, Missouri 65251-0370.

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### About the Cover

*Mule Deer are found throughout South Dakota. In the spring they frequent wooded areas, such as these aspens, where they bear their young. This photo was taken in western South Dakota by John Herbst, of Keystone, SD.*



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# Problems Encountered Assessing AIDS Awareness Among Rural Mid-West High School Students in a Family Practice Setting

Lorraine L. Hazard, MD

## ABSTRACT

There has been growing interest in assessing AIDS awareness and knowledge of risk behavior among teenagers and how to measure the effectiveness of HIV education programs. A survey modeled after the CDC assisted study was distributed to three populations of high school students within a mid-western community to compare results with the CDC urban sites. Of 186 surveyed, the area results were comparable to urban sites and generally evidenced superior AIDS knowledge and lower incidence of high risk behavior. Ignorance and high risk behavior in rural areas warrants HIV education programs. The survey showed 58.6% of high school students regard their family physician as a primary source of AIDS information.

The Center for Disease Control (CDC) assisted state and local health departments in assessing Human Immunodeficiency Virus (HIV) - related awareness among high school students in states and cities with the highest cumulative incidence of Acquired Immunodeficiency Syndrome (AIDS). The results of the survey were published in the *Morbidity and Mortality Weekly Report*. The survey included samples of students in grades nine through twelve, in six cities, Chicago, Los Angeles, New Orleans, New York City, San Francisco, and Seattle and nine states - California, District of Columbia, Kentucky, Michigan, New Jersey, New York, Ohio, Pennsylvania and Washington. Data from a specific city were collected and analyzed separately from its respective state. A representative sample of students among sites were obtained; sample sizes in each site ranged from 778 to 7,013 students, and the response rate of schools from each site ranged from 52% to 100%.

Sparked by the survey, I sought to determine how high school students in our rural mid-west community compare. I am a National Health Service Corps physician assigned to Union County, South Dakota. Our immediate catchment area includes three community high schools within Union County, which has a population of approximately 10,000 total. The popula-

tions of the three communities are approximately 900, 600 and 1700 persons respectively and the communities are located 50, 15 and 25 minutes north of Sioux City, Iowa. The respective high school enrollments are 125, 177 and 162 students.

## METHODS

A nine item self-administered anonymous survey questionnaire was designed utilizing the salient features regarding beliefs, knowledge and behavior surrounding AIDS as in the CDC assisted survey. It was delivered to the three high schools in our area. The questionnaire was rejected by one high school principal who refused to allow its distribution simply because it was about AIDS. The second high school participated but returned questionnaires were found to have been modified by the superintendent of schools, as he found questions 7, 8, and 9 objectionable. (Figure 1 & 2) Finally high school students in the third community completed the original questionnaire at our remote satellite clinic where they presented for athletic physicals required for sports participation in school and routine out-patient visits. This family practice clinic provides the only immediate available medical care in the surrounding communities, thus high school students visiting this site and those tested at school represent a fair sample of this patient population.



### Union County Modified Questionnaire

(See questions 7-9)

#### AIDS QUESTIONNAIRE

Please complete the following questionnaire to help us determine how best to improve your knowledge of AIDS.

Please fill in your age only: \_\_\_\_\_

Answer the questions below True or False.

Students my age should be taught about AIDS in school. T\_\_F\_\_

AIDS can be spread by:

Shaking hands. T\_\_F\_\_

Giving blood. T\_\_F\_\_

Mosquito or other insect bites. T\_\_F\_\_

Using public restrooms. T\_\_F\_\_

Having a blood test. T\_\_F\_\_

AIDS can be spread through sexual intercourse. T\_\_F\_\_

The risk of contracting AIDS does not increase by having sexual intercourse with more than one person. T\_\_F\_\_

Injecting drugs into my veins by needle does increase the risk of contracting AIDS. T\_\_F\_\_

Please fill in below where you would go to get information about AIDS.

\_\_\_\_\_

Figure 1

### RESULTS

A total of 186 questionnaires were utilized (total of all responders from those distributed) eliminating students less than 14 years of age. The response rate of schools in the CDC survey ranged from 52% - 100%. Ours was 62%,

| <u>Number Tested</u> | <u>Age</u> |
|----------------------|------------|
| 42                   | 14         |
| 44                   | 15         |
| 54                   | 16         |
| 33                   | 17         |
| 13                   | 18         |

Of the two questionnaire formats, questions 1-6 were identical, questions 7-9 were modified. Of all age groups a minimum of 84% agreed that they should be taught about AIDS in school. Eight nine percent was the minimum of all respondents in the CDC survey. As in the CDC survey, knowledge about sources varied widely with the majority citing a physician or hospital for accurate information. Of all the students surveyed, 97.5 % knew that AIDS is not transmitted through shaking hands; slightly better than the CDC range of 85.5%-95.6%. The majority of students believe AIDS can be transmitted by giving blood as evidenced by a maximum of 47% answering question three correctly among the 14 years olds with a minimum of 15% among the 18 year olds, compared to 27.8% to 53.3% of the CDC survey. Overall the 18 year olds answered most incorrectly regarding AIDS transmission via insect bites at 85%. The 16 year olds scored highest with 76.5% answering correctly compared to the CDC range of 28.9% to 46.8%. Transmission by use of public restrooms was answered incorrectly by only 2.5% - 23% of the students compared to 25.4% - 58.2% in the CDC sample. In the CDC survey, 49.6% - 75.4% correctly responded regarding transmission via a blood test. Only 47.5% - 63% in our survey answered correctly.

Among high schoolers at the two sites, only two students - one 14 year old and one 15 year old of the 52 surveyed, were injecting drugs. Of those students responding to the original questionnaire it was documented that:

17 of 19 14 year olds (89.4%) had never had intercourse;

10 of 13 15 year olds (76.9%) had never had intercourse;

7 of 16 16 year olds (43.7%) had never had intercourse;

3 of 4 17 year olds (75.0%) had never had intercourse;

### Union County Original Questionnaire

(See questions 7-9)

#### AIDS QUESTIONNAIRE

Please complete the following questionnaire to help us determine how best to improve your knowledge of AIDS.

Please fill in your age only: \_\_\_\_\_

Answer the questions below True or False.

Students my age should be taught about AIDS in school. T\_\_F\_\_

AIDS can be spread by:

Shaking hands. T\_\_F\_\_

Giving blood. T\_\_F\_\_

Mosquito or other insect bites. T\_\_F\_\_

Using public restrooms. T\_\_F\_\_

Having a blood test. T\_\_F\_\_

I have never had sexual intercourse. T\_\_F\_\_

I have not had sex with more than 1 person. T\_\_F\_\_

I have never injected drugs into my veins. T\_\_F\_\_

Please fill in below where you would go to get information about AIDS.

\_\_\_\_\_

Figure 2

| CDC ASSISTED SURVEY                              |               | UNION COUNTY SURVEYS |             |
|--|---------------|----------------------|-------------|
| RANGE OF STUDENTS WHO:                           |               |                      |             |
| Agreed that AIDS should be taught in school-     |               | 89% - 96.8%          | 84% - 92%   |
| Knew AIDS is not transmitted through-            |               |                      |             |
| Shaking Hands                                    | 85.5% - 95.6% | 97.5% - 100%         |             |
| Giving blood                                     | 27.8% - 53.3% | 15% - 47%            |             |
| Insect bites                                     | 28.9% - 46.8% | 38% - 76.5%          |             |
| Public restrooms                                 | 41.8% - 64.6% | 77% - 97.5%          |             |
| Blood tests                                      | 49.6% - 75.4% | 47.5% - 63%          |             |
| Had ever injected drugs-                         |               | 2.8% - 6.3%          | 5.2% - 7.6% |
| Knew AIDS is transmitted via sexual intercourse- |               | 88.8% - 98.4%        | 95% - 100%  |
| Have had sexual intercourse at least once-       |               | 28.6% - 76.4%        | 11% - 57%   |
| Have had more than 1 sex partner-                |               | 15.1% - 42.6%        | 12.5% - 25% |

Figure 3

3 of 19 14 year olds (15.7%) reported having sex with more than 1 person;  
 3 of 13 15 year olds (23.3%) reported having sex with more than 1 person;  
 2 of 16 16 year olds (12.5%) reported having sex with more than 1 person;  
 1 of 4 17 year olds (25.0%) reported having sex with more than 1 person.

## DISCUSSION

While the numbers are small, the sample is representative of our rural mid-west community. Can any conclusions be made? Our communities are comparable, if not somewhat better, in AIDS general knowledge. As expected, there is less high risk behavior, but indeed we have cause for concern.

Beliefs and attitudes regarding the full spectrum of AIDS, as reflected in the circumstances hampering our survey, undoubtedly reflect the nation's problems facing the AIDS dilemma. The rural mid-west sensibilities, conservatism and traditional values are expected to be easily offended. Within our area the low incidence of AIDS is constantly cited, and unfortunately often used as rationale on the part of patients and sometimes staff for not practicing universal precautions. The high school student is particularly at risk due to ignorance, misconception, the adolescent sense of invincibility, fears and insecurities of parents, teachers and the community. The survey showed high school students regard their family physician as a primary source of AIDS information. A major contribution of the family physician can be to help the public approach the problem of AIDS rationally and objectively.

## ACKNOWLEDGEMENT

Many thanks to Ms Loria Crow, Medical Transcriptionist, for the preparation of this manuscript.

## AUTHOR

Lorraine L. Hazard, MD, Medical Director, Union County Health Foundation, Elk Point, SD.

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**M. George Thompson, DO, President  
South Dakota State Medical Association**

**T**he South Dakota State Medical Association has taken an alternative approach to new legislation this year. It seems that in the past we either reacted to or worked against bills which affected the organization. This has at times portrayed a negative image to our elected officials.

Our position this year is to try and make the bills palatable by working with the Governor and legislature. Sometimes only a few minor changes are needed. We have, through our very qualified lobbyists and with physician input, been able to accomplish this in a number of instances.

This has been especially true with the Governor's health reform bill, the pharmacy act and the tax bill for Medicaid funding. All of these were amended for the better and made it possible for us not only to live with but also to actively support. Dr Krafka, especially, should be given a lot of credit for his extensive work with the Governor's bill.

There are still some bills that are impossible to support and at least one of these we will probably lose. This is the renowned chelation bill. We still testify to the scientific facts but will not push our representatives to vote against their small but very vocal constituency. By pursuing this philosophy we hope that when medicine speaks it will have a greater impact than in the days we were perceived to be negative and against everything.

As I write this letter in February, this new tact seems to be working and I feel it is a much better way. It has improved working relationships in my district. Hopefully this will also happen in yours.



# South Dakota Foundation for Medical Care

## SDFMC Intensification of Review

At the end of every calendar quarter, South Dakota Foundation for Medical Care (SDFMC) is responsible for determining whether the number of Medicare adverse determinations in individual hospitals exceed the intensification error thresholds established by the Health Care Financing Administration (HCFA). SDFMC counts admission denials and billing errors resulting in a changed DRG. The number of denials for each provider is then adjusted by subtracting the number of reconsiderations during the quarter resulting in a reversal of the denial. The number of DRG changes is adjusted by subtracting the number of DRG re-review appeals during the quarter in which the DRG was changed back to the original DRG. If the adjusted error rate exceeds the HCFA threshold, SDFMC is required to increase the number of cases reviewed during the following quarter. The HCFA threshold is 6 or more admission denials, or 6 or more DRG changes, with a denial rate or DRG change rate of at least 5% of the total Medicare inpatient claims reviewed during the quarter.

For example, suppose SDFMC reviewed 119 Medicare claims in calendar quarter ending March 31, denied 7 claims, and reversed through reconsideration 3 denials from the previous quarter. The adjusted number of denials would be four (7 minus 3) and the denial rate would be 3.36% (4 divided by 119 multiplied by 100), which is below the threshold. The reduction for reconsideration for denials is based upon the quarter in which the denial is reversed, not the quarter in which the denial occurs.

If for the same provider SDFMC changed DRGs on 6 claims during the calendar quarter ending March 31, and there were no appeals of DRG changes finalized during that quarter, the total DRG errors would be 6 cases with a rate of 5.04% (6 divided by 119 multiplied by 100). The hospital would exceed the HCFA threshold and require intensified review.

SDFMC will notify a provider of intensification of review within 20 working days of the end of the calendar quarter. The intensification will result in an increase in the number of cases selected for review during the next 3 months, and continues until the provider's error rates decrease below the HCFA threshold. If SDFMC can identify a pattern of denials or DRG changes, such as two or more DRG changes for the same DRG, intensification can be focused on a subset of claims. If no pattern exists, SDFMC is required to increase the number of reviews to 25% of all inpatient Medicare claims received from HCFA, in addition to the normal sample.

If the provider continues to exceed the threshold for denials or DRG changes for the following quarter, intensification continues, but at a rate of 50% of all inpatient claims received from HCFA. If the error rate continues for a third quarter, SDFMC is required to refer the matter to the HCFA Office of Inspector General for consideration of a sanction.

### Guidelines in Transfusions - What's New?

**W**e might as well learn to live with guidelines as they are being promoted not only by third party payers but also by the AMA and specialty societies. Since I thought that one of the important parts of medical education is to enable one to understand why we perform certain diagnostic or therapeutic procedures and then be able to justify and document those reasons, our training provides us with guidelines. What is more if we can get appropriate practitioners with expertise to devise and revise such guidelines as necessary, we ought to be appreciative.

However, there are obvious pitfalls. If we are to be effective in employing guidelines, they must be treated as monitors for medical staff quality improvement and be approved by the medical staff, reviewed and revised periodically and only be adopted after they are shown to be based on sound state of the art data. Most importantly, deviations from them must be reviewed by peers. In other words, they cannot be arbitrarily applied.

The judicious use of blood transfusions has been recognized for many years. There have been remarkable advances in blood safety, mainly through reductions of transmission of infectious agents. Cytomegalovirus transmission can be reduced by pretransfusion testing and possibly leukocyte filters. Pretransfusion testing and donor screening has markedly reduced the likelihood of acquiring Hepatitis B (HBV), Human Immunodeficiency Virus (HIV), Human T Lymphocytotropic Virus (HTLVI), and most recently Hepatitis C (HCV) to very low levels. Unfortunately, the hazard of the above will never entirely vanish. Chills, fever and urticaria occur in over 1% of transfusions usually due to reactions to donor leukocytes although some of these may be reduced by leukocyte filters. However, serious hemolytic reactions (1:6000) resulting in renal impairment or fatality (1:100,000) are a cause for concern. Iron overload, immune suppression resulting in increased bacterial infection and perhaps in decreased survival in patients with malignancy, graft vs host disease, and transfusion related lung injury occur with not well known prevalence. *Yersinia enterocolitica* infections after packed red cell transfusion and bacterial infections after platelet transfusion also indicate we still have much to learn about infectious agents.

Wise use of blood transfusion is also indicated because of increasing demand for blood and blood components and because donor screening and pretransfusion testing have led to more donor rejections resulting in blood shortages.

A reason why guidelines for blood transfusion cannot be arbitrarily applied is best exemplified by the widely utilized transfusion trigger of the now outmoded "10/30 rule" (hemoglobin 10g/dl, hematocrit 30%). No arbitrary level of hemoglobin can be applied during hemorrhage since hemoglobin values do not reflect the true level for up to 1-3 days and because cardiopulmonary conditions may necessitate transfusions in older or sicker patients at higher levels of hemoglobin than in younger or more healthy patients. In spite of this fact the hemoglobin threshold is still widely used according to a review of the literature and will continue to be promoted. Incidentally this threshold has been lowered to 8.0g/dl (Transfusion Practices Committee of the American Association of Blood Banks) or even 7.0g/dl (NIH Consensus Conference on Perioperative Blood Transfusion).

If you feel a patient needs a blood transfusion above a threshold for red cells or any blood component, you can record a reason for doing so such as suggested above for red cells. Even in this case, it is wise to remember alternative solutions for raising the hemoglobin level such as folate, iron and vitamin B12 for specific chronic anemia or becoming acquainted with the appropriate use of erythropoietin which has been applied in the anemia of renal failure and in AIDS patients with anemia caused by azidothymidine. Other anemias in which erythropoietin may be useful are actively being studied.

We have learned that use of red cell transfusion is almost entirely to increase oxygen carrying capacity and subsequent oxygen delivery to the tissues. It must be appreciated that the transfusion of red cells should thus increase oxygen supply to tissues and also decrease cardiac contractility. However, blood bank blood may have transiently low 2,3 DPG (2,3 diphosphoglycerate), a compound which promotes release of oxygen from red cells to tissue. This might lead to tissue hypoxia. The higher hematocrit post transfusion also increases blood viscosity and thus may impair microcirculation. Other rationales for blood use such as promotion of wound healing or general well being are unproved and are not justifiable reasons for transfusion.



Lastly, what about undertransfusion? Almost all the above would result in less utilization of blood. Certainly inappropriate undertransfusion must also occur. Ways to assess this in individual cases is difficult but the area is being studied.

John F. Barlow, MD  
Editor

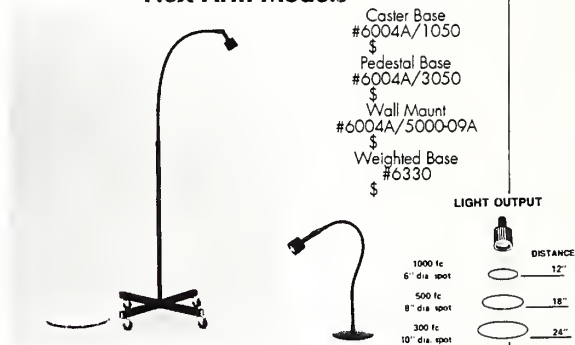
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Ruth Parry, President, South Dakota State Medical Association Auxiliary

### Doctors' Day—a symbol of commitment

On March 30, 1842, ether was first used as an anesthesia for surgery by Dr Crawford Long, in Georgia. This 26 year old physician, who had been practicing medicine for less than a year, administered sulfuric ether to a 21 year old patient. While Dr Long made no secret of what he had done and spoke freely of it wherever he went, it was nearly seven years after this history-making event before he informed the medical profession of his findings. He continued in the practice of medicine for nearly forty years and was held in high esteem by his colleagues.

It is appropriate that an anniversary date of such a discovery, by a man dedicated to his profession, be selected as a day to recognize all physicians. Since a congressional resolution was passed in 1958, this date has been designated as national Doctors' Day, an annual observance to honor members of the medical profession.

The first Doctor's Day observance was initiated by the auxiliary to the Barrow County Medical Society,

Barrow County, Georgia, on March 30, 1933. This year marks the 60th anniversary of that first celebration. It is recorded that the initial ceremonies included placing flowers on the graves of deceased physicians and was concluded with an elegant four course dinner with appropriate toasts and responses.

Although it is not possible for us to do exactly as was begun in Barrow County, we in the SDSMAA do want to call attention to the significance of the day. To those physicians who work diligently each day, we offer encouragement to continue. You are appreciated by patients, by your family, and by other health care professionals. To those physicians who are in retirement, we say thank you for a life-time of commitment and caring. You are missed but your contribution is appreciated. To those who are widows/widowers, we join you in remembering the significance of the medical profession in your lives. Doctors' Day is for all of you.

In this time of change in our society, it is well for each of us to remember the original congressional resolution of March 30, 1958, stating that "society owes a debt of gratitude to our physicians—the men of science—for their contributions to the enlargement of the reservoir of scientific knowledge and the increase in the number of scientific tools...and society owes a debt of gratitude to our physicians for their sympathy and compassion in ministering to the sick, and in alleviating human suffering." This commitment to those in need, which was publicly recognized more than thirty five years ago, has been the guiding force for the profession and will not cease to continue to be of high importance. Let us use this day of recognition as a symbol of commitment to the profession of medicine by spouses and physicians.



### **The Great Enigma: Sex as it Relates to Emotional Stability, Physical Pleasure and a Productive Life**

*Roscoe Dean, MD*

**M**odern entertainment and communication media demonstrate that sexual activity is one of the most sought after experiences. The act can be a blessing or a curse to the patients we care for. In the spirit of reflecting on the complexities of human nature, I wish to share some anecdotes gleaned from my experience in the military, and as a family physician and confidant.

Millie was a keen lady with many educational degrees who had moved to this area to care for her terminally ill mother. She had been a scrub nurse for a famous Kansas City surgeon. A few months after joining our staff, Millie seemed to lose her enthusiasm. She came to my office complaining of dysuria. There were a few cells in her urine but no bacteria. The subjective discomfort did not improve with the usual medication. She then asked for permission to take a short vacation. When she returned, she was bubbly and happy. A microscopic examination of her urine revealed numerous sperm. I didn't mention the evidence of what apparently had contributed to her improved physical and mental health but I did ask what she thought made her feel better. Her answer was, "It was so good to be with friends again".

It was a hot summer evening when the County Sheriff came to get me to accompany him to a ranch home where a mentally disturbed man was threatening to kill anyone who came near. I agreed to go with him but suggested that we ask a lady who was a friend of the disturbed man to go along. She agreed after I assured her that I would go in with her. The officers let us out a short distance from the house and hid with their guns drawn. We walked to the house. She knocked on the door and called to the troubled man. We heard him pump a shell into his gun as he unlocked the door. She whispered to me, "I guess I better go in alone." She unbuttoned her blouse, took off her bra and slipped through the door. There was talk, some mumbling and then all was quiet. After a time, she opened the door and said, "Joe feels better now, he will talk to you".

During the Korean War, I was assigned to the obstetric and gynecology staff of William Beaumont Army General Hospital in El Paso, Texas. There were many senior military personnel in the area who had postponed starting a family. Those in command decided there was a need for a so-called infertility clinic and I was appointed director. One of our successes was

the delivery of a healthy baby boy for a handsome couple. The father was a fighter pilot who was on orders to join his wing in the Orient. When the officer came to say goodbye to his wife and newborn son. I was on duty and wheeled the mother to the hospital visitors' lobby. An idling jeep, with a uniformed driver, was waiting. The officer, dressed for flight, stooped to kiss his wife. She held his face close and whispered, "Remember, if you get it anyplace else, it's only if you pay for it". Later, I was in attendance when a truly great and honorable commander made essentially the same statement before officers preparing for active duty.

On an occasion many years ago a trouble maker from a neighboring community insisted I give him something to, in his words, "get my sex back". I refused, but a few hours later, he came to the office and kept insisting. In desperation, I gave him a shot of testosterone. About 10 o'clock that evening the phone rang. It was the testosterone recipient, Jack. He said he had terrible chest pain. I asked if he could drive. He shouted, "of course". He lived in a town 26 miles away. In approximately 24 minutes, a car roared by our home, which was located near the hospital. The horn was blasting. I hurried to the hospital. Jack was there, ashen grey, sweating, with no blood pressure. He died a few minutes later. An autopsy revealed coronary sclerosis and a ruptured left ventricle. Jack's wife volunteered that the pain started during intercourse.

On another summer day, a rugged no-nonsense rancher dashed into my office in rural South Dakota. He pushed the receptionist aside and came to the back of the office where I was standing. He whispered loudly, "Doc, I got to talk to you". In an examining room he blurted out, "Can you find out if I am any good?" The man, with his wife and daughter, had moved to this area a few years earlier to manage a ranch operation for an out-of-state investor. The crew he took charge of included a young cowboy who eventually became his foreman. The rancher, whom I will call Lester, had never been a patient in our office, but I had treated his handsome wife. Lester's parents, who came to the area with him, lived close by. All were straightforward people, and it was no secret that they hoped for a grandson. Lester's five year old daughter, a beautiful girl, was his constant companion. That morning, Lester and the little girl had started for town to get repairs. A few miles down the road, he realized he had forgotten his checkbook and drove back to the ranch head-

quarters. He walked into the house and discovered his wife having intercourse with the ranch foreman (the foreman was not married). I said, "All right Lester, calm down and tell me what I can do to help". He then blurted out, "I was kind of choking her when she screamed, "Where do you think she came from?" pointing to the little girl. The disturbed rancher then asked, "Doc, can you tell me if I am any good?" I handed him a dish and said, "Put some of your discharge in this and I will see". After a few minutes in the lavatory, Lester handed me the specimen. A careful microscopic study did not reveal even a suspicion of sperm. He volunteered then that he had had mumps as a child. Lester left the office a broken man. His parents insisted that the wicked woman be kicked out. She left with the little girl. A short time later she married the foreman and they moved to another state. It is reported that they have prospered and have a son.

In summary, I prayfully hope these reflections are instructive. As near as I have been able to determine, the thrill and comfort of sexual activity are essentially the same whatever the motive. As physicians, we are in a unique position to understand that sex can be a curse or blessing, resulting in good or harm for the patients we see.

Roscoe Dean, MD  
Honorary Member of SDSMA  
Sun City, AZ (formerly Wessington Springs, SD)



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# South Dakota Society Of Pathologists





**Warren Reinoehl, MD**, died October 17, 1992, at the age of 73. He had left Custer in August and was living in his home in Carlsbad, California.

He was born in 1919, at Bonesteel where he graduated from high school in 1936. He went on to medical school at the USD in Vermillion and he received his medical degree from Temple University in Philadelphia. From 1945 to 1947, he served as a medical officer in the Army. He completed his internship in Des Moines, Iowa and Phoenix, Arizona where he practiced medicine before coming to Custer in 1961.

He served as medical director at Custer State Hospital and was a practicing physician in the community until 1988 when he retired. He was a member of the Reorganized Church of Jesus Christ of Latter Day Saints and faithfully attended Berean Bible Church in Custer.

In 1961, he married Shirley Saienne. He is survived by his wife, Shirley, in Carlsbad, Calif; two stepsons, Ronald Saienne and Jerry Saienne; one stepdaughter, Cheryl Miller; five grandchildren; and one sister, Lillian Taylor, of Custer.

Mosby - Year Book publishers announced in January the publication of the new edition of "Review of Hemodialysis for Nurses and Dialysis Personnel" by **Dr C. F. Gutch, M. H. Stoner and A. L. Corea**. This is the fifth edition of the text on dialysis technique and therapy. The first edition was published in 1971; it and subsequent editions have been widely used, including Dutch and Japanese versions.

\*\*\*\*\*

Three members of St Luke's Midland Regional Medical Center medical/dental staff have been elected for leadership roles in 1993. **Dr Jean Gerber**, general surgeon, will serve as president; **Dr Reid Holkesvik**, family practice physician, was elected vice president; and **Dr John Vidoloff**, physical medicine and rehabilitation specialist, will serve as secretary/treasurer. Other leadership positions include: **Karl Kosse, MD**, as chair of the Surgical Section; **Harvey Hart, MD**, as chair of the Family/OB-GYN/Peds Section; and **Kathleen Van De Walle, DO**, as chair of the Medical Section.

\*\*\*\*\*

**Tom Dean MD**, of Wessington Springs was re-appointed to the Secretary's Advisory Committee on Infant Mortality by Dr Louis Sullivan. Dr Dean has served one year on the Committee and at a recent meeting in Washington, DC, he was sworn in for an additional three year term by Dr Jim Mason, Assistant Secretary for Health.

\*\*\*\*\*

**Denny G. Ortmeier, MD**, died on December 12, 1992, at the age of 58. He was born June 1934, in LaCrosse, Wisconsin, where he grew up and graduated from LaCrosse Central High School. From 1953 to 1956, he served in the military. He married Elaine Bryant in Canton.

He received his BA in 1959, his BS in 1960 and his MA in 1961 from the University of South Dakota in Vermillion. Following graduation from the University of Wisconsin Medical School in Madison he interned at Sioux Valley Hospital from 1963 to 1964 and completed his pathology residency in 1972. He was certified by the American Academy of Family Practice. He also was a member of various committees at Sioux Valley Hospital.

Dr Ortmeier was a physician/partner at the Medical Arts Center in Sioux Falls. From 1986 to 1987, he was chief of family practice at Sioux Valley Hospital and from 1978 to 1980, chief of staff. He was past president and a member of Seventh District Medical Society; a member of the AMA; the South Dakota State Medical Association; SD Academy of Family Practice. He was on the board of directors of South Dakota Blue Shield from 1976 through 1988, and served as chairman of the board of directors from 1982 through 1985. He was a member of Unity Masonic Lodge; Scottish Rite Bodies of Sioux Falls, El Riad Shrine Temple and Good Shepherd Episcopal Church.

Survivors include his wife; two sons: Steven, Sioux Falls; and Thomas, Vermillion; one daughter, Kirsten Reinhardt, Brookings; and three sisters: Mrs. Edward (Sally) Johnson and Mrs. Robert (Kay) Weldy, both of LaCrosse, Wis; and Mrs. Walt (Deanna) Larouche, St. Paul, MN.

Rapid City doctor, **Arthur Lampert, Jr**, was presented the Governor's Award as the outstanding health care professional in the state by the Governor's Advisory Committee on Employment of People With Disabilities.

\*\*\*\*\*

**John McKichan, MD**, has been elected president of the Aberdeen Convention and Visitors Bureau board of directors. McKichan, a family practice physician at the Family Health Center, has been a member of the Convention and Visitors Board since 1991.

\*\*\*\*\*

The American Academy of Ophthalmology honored **Paul Wright, MD**, medical director and president of the board of directors of the Black Hills Regional Eye Institute, for his public and professional service. He also serves as assistant clinical professor at the University of South Dakota. The award was presented during the academy's annual meeting in Dallas.

\*\*\*\*\*

Medical colleagues, Spearfish residents and relatives honored **Dr Warren Golliher** with a reception and dinner in recognition of his 25 years in medical practice in Spearfish.

\*\*\*\*\*

**Dr Scott Eccarius**, ophthalmologist in Rapid City, was board certified and inducted as a fellow by the American Academy of Ophthalmology at a recent meeting in Dallas. He also was named an assistant clinical professor for the University of South Dakota School of Medicine.

\*\*\*\*\*

**Loyd Wagner, MD**, of Sioux Falls is the College of American Pathologists' 1992 Pathologist of the Year. He received the award at the fall college meeting in Las Vegas. Dr Wagner was the group's president from 1989-1991. He also has served in other leadership positions and recently was appointed chairman of the college's new political action committee.

He has been owner and president of Physician's Laboratory; director of laboratories; director of the School of Medical Technology at McKennan Hospital; and a pathology consultant for several South Dakota hospitals.

\*\*\*\*\*

Watertown physician, **Dr Gary Timmerman**, was inducted as a fellow of the American College of Surgeons, the largest organization of surgeons worldwide.

\*\*\*\*\*

**Dr Lawrence Nelson** of Webster and **Dr John Jones** of Chamberlain attended the 44th annual Scientific

Assembly of the American Academy of Family Physicians (AAFP) in San Diego. More than 5,000 family physicians from around the country attended the meeting. They had an opportunity to participate in 26 clinical seminars and visit more than 76 scientific and 350 technical exhibits.

\*\*\*\*\*

**Drs Forrest Brady** of Spearfish and **Thomas J Huber** of Pierre have been recertified as diplomats of the American Board of Family Practice as a result of passing a recertification examination offered by the ABFP. ABFP diplomats must continue to show proof of competence in the field of comprehensive, continuing care of the family by being recertified every six years.

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### September

|                         |        |                    |             |
|-------------------------|--------|--------------------|-------------|
| Susan M. Ostrowski, MD* | Eureka | James E. Ryan, MD* | Sioux Falls |
|-------------------------|--------|--------------------|-------------|

### October

|                      |          |                      |             |
|----------------------|----------|----------------------|-------------|
| Albin J. Janusz, MD* | Aberdeen | Rodney R. Parry, MD* | Sioux Falls |
|----------------------|----------|----------------------|-------------|

### November

|                     |          |                         |        |
|---------------------|----------|-------------------------|--------|
| James E. Gaede, MD* | Mitchell | George J. Mangulis, MD* | Philip |
|---------------------|----------|-------------------------|--------|

\*members of the South Dakota State Medical Association



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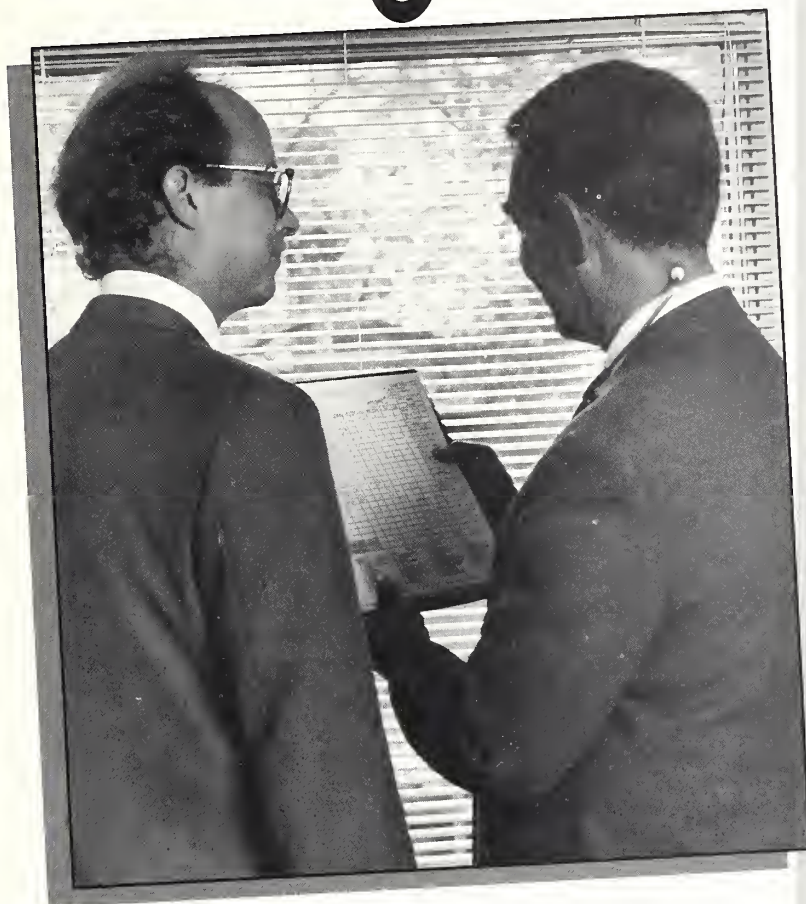
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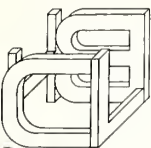
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### Child Abuse By Poisoning

*Debra N. Dees, Pharm.D, Daniel J. Dees, MD, Sioux Falls, SD*

Child abuse and neglect constitute an epidemic affecting at least one million children in the United States yearly. The widespread morbidity of child abuse and neglect is frightening, and its consequences are potentially lethal. It is estimated that two to four thousand children die yearly in the United States as a result of abuse or neglect. About 20% of children abused by toxic exposure will die or have permanent sequelae. Occult poisoning is likely an under recognized and under reported form of child abuse.

Early reports of child abuse focused on unexplained or multiple physical trauma. It later became clear that other more subtle methods of violence could be directed towards children. Poisoning was recognized in the 1970's as a factor in Munchausen Syndrome by Proxy, in which a physical disorder is feigned in order to obtain hospitalization and attention. But the motivations for poisoning a child more often go beyond gross psychopathology in the caretakers. Other motivations include negligence (lack of knowledge or skills), well meaning but misdirected actions (ignorance, unintentional misuse of medications or other agents), punishment and malice (intentional misuse of toxins).

Agents used in intentional poisoning of children are limited only by the imaginations of the abusers. They can be divided into three groups, all of which have been amply documented. The first category includes common household agents such as salt, pepper, water, sugar, apple juice concentrate, sodium bicarbonate, vitamin A, antifreeze, naphtha, pine oil, other hydrocarbons and lye. The second category, that of nonprescription medications, includes emetics, phenolphthalein, milk of magnesia, magnesium sulfate and other laxatives, acetaminophen, and salicylates. The final category is prescription and scheduled drugs. A number of reports indict sedatives and psychotherapeutic agents. Narcotics and other drugs of abuse, including alcohol, cannabis and cocaine constitute an important subclass. Finally, miscellaneous agents including anticonvulsants, antihistamines, diuretics, insulin, iron, metoclopramide, oral hypoglycemics, and warfarin have been cited. Other documented toxic exposures include several cases of microwave burns and at least four reported cases of intentional carbon monoxide poisoning.

Because of the wide array of toxic agents, clinical presentation can be varied. Neuropsychiatric symptoms can range from drowsiness and stupor to seizures, from bizarre motor movements (myoclonic jerks, tremors, extrapyramidal signs) to hallucinations. Respiratory symptoms can range from hyperventilation to apneic spells. Cardiac symptoms and signs can range from tachycardia to vascular collapse. Gastrointestinal symptoms can range from thirst and oral ulcerations to diarrhea, vomiting and hematemesis. Laboratory findings may be peculiar and difficult to explain if toxic exposure is not considered.

In dealing with child abuse, particularly in bizarre or unthinkable circumstances such as poisoning, it is imperative that the practitioner maintain objectivity. As one writer has stated, "Complex and atypical phenomena provoke confusion and aversion in observers". The health care professional must be willing to shed his or her biases and maintain a high index of suspicion. Although it might seem less likely, most often the abuser is a woman, 80% of the time the perpetrators regularly live in the home with the child and 80% of abused children are living with married parents. Even more remarkable, about 20% of the time the abuse will continue surreptitiously even while the child is hospitalized. Only about one in five of intentionally poisoned children will also have been battered physically. Absence of signs of physical abuse is no guarantee of safety. Deliberate poisoning is most frequent in children less than 2 years of age, and may present as repeated episodes.

Next, it is important to empathetically obtain a history and gather information. The health care worker must listen for discrepancies and be aware of ambivalence, lack of concern or anger. Remember that "no matter what the type or motivation, and whether or not abuse or neglect are issues, childhood poisonings most often occur in families under stress". The professional should be attuned for evidence of stress, chaos, disorganization, isolation, paranoia, frustration and intoxication in the family. Using common sense, one can usually tell if the story fits the circumstances and if the home situation is troubled.

Finally, if child abuse or neglect of any type is suspected, it is imperative that an appropriate referral



be made. All states have laws which require reporting of suspected child abuse or neglect. In all states, criminal penalties are specified for failure to report suspected (not proven) abuse. In South Dakota, contact Child Protection Services in the Department of Social Services. A report is in behalf of the child. Rather than to insure prosecution of a perpetrator, the purpose of reporting is to insure that the needs of the child and family are met.

It is imperative that poisoning as a form of child abuse be recognized and addressed appropriately. Meadow warns that "Unwillingness or inability to recognize child abuse deprives the child of the opportunity to be shielded from future harm." Remember that one fifth of intentionally poisoned children will die or have permanent sequelae. And finally, the great majority of abusers were abused. Without intervention the patterns of abuse will be perpetuated in future generations.

#### REFERENCES

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Edited by Brian Kaatz, Pharm.D.



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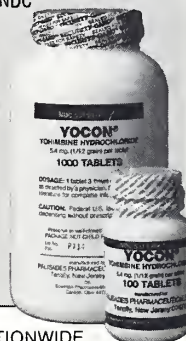
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#### References:

1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

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## Correspondence

*This letter was dated August 10, 1992, and did not reach Dr Freeman's office until February 2, 1993, quite damaged. Evidently it was lost in the mail.*

Dear Dr Freeman:

I read your editorial in the April issue just now. I greatly agree with it, having been diligently concerned in my pre-med days to acquire all the Liberal Arts and Humanities possible. I had "little Latin and less Greek", but did what I could.

We learn from the past what sort of creatures we are, and some of us are capable of being touched with admiration for our ancestors, who, after all, were as complicated as we are. Just as it is never too late to have a happy childhood, it is never too late to re-read Homer; maybe a Great Books for residents? The "flowing-haired Greeks" of Homer were the ancestors of the Spartans, whom a 19th Century poet described before the Battle of Thermopylae as "the Greeks sat on the sea-green stones and combed their flowing hair". That kind of insouciant courage should reach across the ages to any thinking man.

James W. Wiggs, MD  
Yankton, SD

I would like any report of deaths or near deaths from anaphylaxis due to food or insect allergy. I would also like reports of deaths that were prevented by the use of epinephrine kits.

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Claude A. Frazier, MD  
Asheville, NC

Dear Dr Barlow:

I just read your editorial on fine needle aspiration. I wish to take this moment to applaud your viewpoint on this matter. I essentially am in full agreement with all seven points you made in your editorial.

I believe fine needle aspiration biopsy of the thyroid is an extremely valuable tool in the management and evaluation of thyroid diseases. I suspect that the use of fine needle aspiration biopsy continues to be somewhat under-utilized. We have performed approximately

1,000 biopsies over the last several years, and I have come to recognize the strength of this procedure. On the other hand, I have seen situations where biopsies have been done by personnel who only do them infrequently and, in particular, have perhaps less than optimally communicated with the pathologist to be certain that all potential considerations are being considered.

As you pointed out, managing thyroid nodules goes beyond a simple biopsy, as long-term management and follow up must be appropriate and include the clinical course as well as information gained from the biopsy.

Thank you for stating what I believe has clearly been the experience of those of us who are doing thyroid biopsies on a regular basis.

T. A. Schultz, MD, FACP  
Central Plains Clinic  
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Volume 46/No. 4 April 1993

(ISSN 0038-3317)

Official Publication of the  
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the South Dakota Chapter of the  
American College of Surgeons  
the South Dakota Psychiatric Association  
of the American Psychiatric Association

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SOUTH DAKOTA JOURNAL OF MEDICINE (ISSN 0038-3317) is published monthly by the South Dakota State Medical Association, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Subscription price: \$15 per year domestic, \$18 per year foreign, \$1.75 for single copy. Second class postage paid at Sioux Falls, South Dakota 57101 and additional mailing offices. POSTMASTER: Send address changes to SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105.

NATIONAL ADVERTISING: Contact State Medical Journal Advertising Bureau, Inc, 711 South Boulevard, Oak Park, Illinois 60302. Phone: 708-383-8800.

LOCAL AND CLASSIFIED ADS: Contact Jeri Spars, SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Phone: 605-336-1965.

PRINTER: The Ovid Bell Press, Inc, PO Box 370, Fulton, Missouri 65251-0370.

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This windmill was photographed by Joel Strasser and appears in his book "Where My Heart Is". He is a well-known South Dakota photographer who lives near Canton, SD.

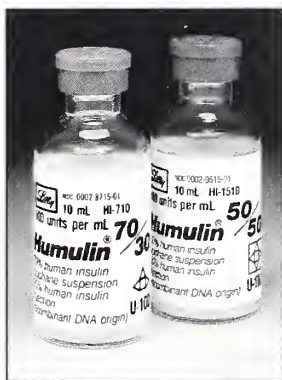




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**M. George Thompson, DO, President  
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I read an article the other day; an article entitled, "A Call to Action", by Dr Burton Lee, a former White House physician. In the next issue some doctors responded. There was one response which highlighted the situation. It said, "We are in the fourth quarter and the team with no doctors has the ball".

Hillary Rodham Clinton has 250 members on her board and none are physicians. She says they are a special interest group and have no right to work on their own destiny. She has also sworn her people to secrecy as to their progress until it is finished. Some of them are leaking their decisions. This is probably planned, but we do have some friends on the board.

They have decided to cut Medicare payments to hospitals and physicians. Now remember, hospitals are paid 85% or less of actual cost. When asked if this wouldn't cause more cost shifting, she said there will be a companion bill to make that illegal. We figure if this passes, up to 40 hospitals in South Dakota will close within a year.

There is a Governor Wannabe in the state senate who wants to tax doctors' services to pay for increased numbers of Medicaid recipients. Since we lose money on this program now, more will opt out of the Medicaid system. This same senator ran on no tax increases—period. I guess doctors don't count.

If someone can explain all this logic, I would be glad to hear from you. A "call to action" means speaking as one voice. Let's begin the process at the state convention in June.



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### On Computers, Waiting, and the Patient's Vulnerability

On a recent Saturday morning, I combined troubleshooting a problem on a new computer with reading excerpts from *At the Will of the Body* by Arthur Frank.<sup>1</sup> While these two activities seem (and are) disparate, I did find myself making some connections.

First, it must be acknowledged that I am computer illiterate. For a number of years, I had used a very basic word processing program for simple typing and had never ventured beyond this rudimentary function. Then I purchased a new IBM compatible computer for my son. Suddenly, I was confronted with a computing world of power and complexity that far exceeded anything I had experienced. The functions, options, and speed of the new system were astounding. Fortunately, I had a friend who fielded frequent, sometimes frantic, questions about software adjustments and corrections. But there was one illusive glitch that even he couldn't solve. As I typed, there was an annoying flicker or flash of light behind the words. At first, I tried to convince myself that this was normal or just my excessive sensitivity to the way the system worked (I suppose like many patients do when they are trying to decide if a new symptom is really significant or imaginary). When other observers verified my observation, I decided to call the company's 1-800 number for technical assistance. Naively, I suppose, I expected to immediately be connected with the appropriate expert. Instead, I repeatedly called the number and obtained a busy signal. Finally (after thirty or so unrewarded attempts), I reached a computerized answering message, which put me on hold. After twenty more minutes of waiting, a live (i.e. she actually talked back to me) receptionist told me that all circuits were busy and took my number for a return call.

It never came. So, a few days later, I repeated the process after first calmly preparing myself with coffee, cookies and reading material for the wait. The process repeated itself—first the busy signals, then the voice computer, then a fifteen minute wait which finally ended with a live technician. He seemed vaguely (but professionally) perplexed and gave me a number of suggestions dealing with "electrical surges". It didn't help. I repeated the calling process, got another technician and was given a long series of instructions on how to reprogram something to eliminate the problem. I tried to write these down legibly and implement them. They didn't work. Again, I repeated the telephoning process, with its waiting, and finally got a third technician who took me through a step-by-step reprogramming process. I understood little of what I was

doing, simply typing commands and choosing options that he impatiently gave me—e.g. "DOS prompt, enter, 1024/600 select non interlaced menu choice, std VGA timing, CD/return option" etc. I don't actually understand or remember most of these commands; I am just dutifully copying from the notes I took from this fellow.

Anyway, when the third technician took me back to the word processing program and my uncertain fingers tried the typing program, the villainous flicker had actually disappeared. In my gratitude, I decided that maybe the multiple calls, the long waits (probably over one and a half hours all told) and frustrations with the company, were somewhat understandable. Surely, many people are constantly calling with problems, and the technicians (like physicians), cannot know in advance how long each call will take. Some troubleshooting probably takes thirty seconds. I was on the telephone with the third technician for at least twenty-five minutes. Waiting, in this context, begins to seem philosophically unavoidable (or at least understandable). I was vastly relieved to have the problem solved, rather than having to resort to the painful, surgery-like option of disconnecting my computer and sending it back to the company for analysis.

I suppose our patients, when confronted with similar long waits, frustrations and uncertainties, may come to a grudging accord with the system and acceptance, especially if we are lucky enough to be able to solve their problems or, at least, ameliorate them. As I was reflecting on my computer ordeal, analogies to the patient's situation came easily. Just as I was distressingly intimidated by and fearful of my vague, but persistent computer screen problem, so too must the patient face incredible fear and frustration with many aspects of the medical system such as inevitable delays, repeated testing, and frequent uncertainties of diagnosis.

I began these reflections by noting that I was reading Frank's book while waiting for the third computer technician to get on the telephone. Just before the technician took me off hold and began the process of computer healing, I was reading of Frank's account of his persistent pelvic pain which was ultimately diagnosed as testicular cancer. He recalls: "In pain the natural rhythm of rest and activity is lost, and that loss leads to further losses of plans and expectations, of a life that makes sense as a fitting together of past and future. Order breaks down, and incoherence takes its place." Somehow, the temporary breakdown of my computer's order and the vast and confusing computer programming adjustments which I had to fearfully make at the command of the unseen voice of the technician, made me particularly sensitive to Frank's reflections on being a patient. It must be a terrifying and frustrating circumstance for many of our patients to witness the



breakdown of the order and functioning of their lives. To suffer the incoherence of obscure medical terminology, intimidating technologic testing, and the foreign hospital environment must pose an incredible disruption to the privacy and workings of a patient's very being. To be faced with a true breakdown of former health, especially if it seems to be permanent, invites a personal chaos and concern that "things will never be the same". As physicians, we would do well to try to be sensitive to such realities. Working to see each of our patients as a unique, vulnerable individual helps. So does focused attentiveness to the specifics of each patient's story and context.

Being frightened and intimidated by computer malfunction is bad, but in the global order of things, pretty minor. After all, one can turn one's back and walk away from the whole technologic realm if need be, and life can still go on. The patient, faced with the uncertainty and upheaval of physical vulnerability and even death, is enjoined to accept much more limited options. As caregivers, we have much to listen for and see and understand. Our challenge, too, is daunting.

Jerome W. Freeman, MD

Editor

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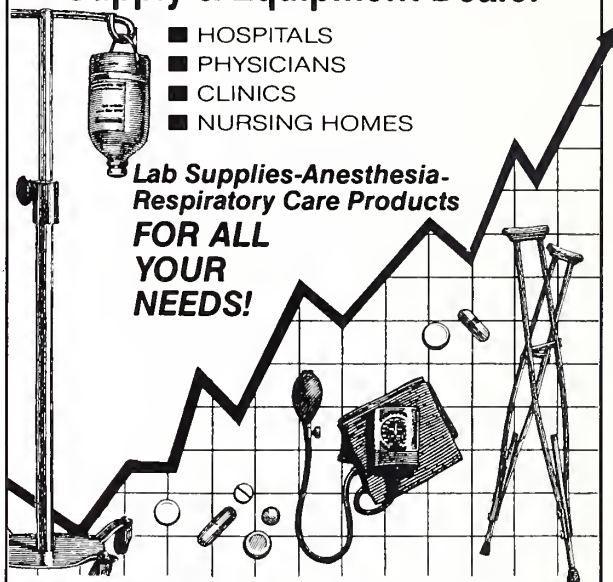
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# Munchausen's Syndrome: A Brief Review

Dennis G. Leland, MD

## ABSTRACT

Munchausen's syndrome, a chronic factitious disorder, is appropriately named after an 18th century German nobleman who was noted for his story-telling ability. The disorder is an interesting oddity; however, it may not be as uncommon as most think. Behavioral motivations and clinical presentations of the illness are variable and make diagnosis difficult. Approaches to treatment vary widely and success remains elusive. As a result of their manipulative behavior and their desire not to "respond" to medical intervention, these patients are extremely frustrating to treat. The illness represents an emotional and economic stress on an already stressed medical system. If the diagnosis is suspected, efforts should be made to direct the patient toward expert sources for further evaluation and treatment.

Munchausen's syndrome was first described by Asher in 1951.<sup>1</sup> It is characterized by patients who seek repeated admission to hospitals. They give histories in a very dramatic fashion, occasionally self-inflicting wounds to make their story more plausible. A person with Munchausen's syndrome characteristically will become indignant and sign out of a hospital against medical advice when their hoax is discovered and they are confronted with the evidence.

The disorder is classified in the DSM III as chronic factitious disorder with physical symptoms.<sup>2</sup> It was originally called Munchausen's Syndrome after Baron Karl Friedrich Hieronymus von Munchausen, an 18th century German nobleman who was known for his telling of tall stories. This story about a bear is but one of many:

Day-light and powder were spent one day in a Polish forest. When I was going home, a terrible bear made up to me at great speed, with open mouth, ready to fall upon me, all my pockets were searched in an instant for powder and ball, but in vain—I found nothing but two spare flints: One I flung with all my might into the monster's open jaws, down his throat. It gave him pain, and made him turn about, so that I could level the second at his back-door, which, indeed I did with wonderful success, for it flew in, met the first flint in his stomach, struck fire, and blew up the bear with a terrible explosion. Though I came safe off that time, yet I should not wish to try it again, or venture against bears with no other defense.<sup>3</sup>

Similarly, a Munchausen's syndrome patient is an

expert at conniving and subterfuge. The art of faking an elevation in temperature to them may be routine; hematuria can be easily produced with the prick of a finger; bleeding disorders produced by the taking of a cache of anticoagulant medicine. The real "art" becomes apparent in the contortions and agony they go through to feign abdominal pain. This must surely take a seasoned actor.

The diagnosis of Munchausen's syndrome is made based on the criteria set forth in the DSM III as follows: 1. Plausible presentation of physical symptoms that are apparently under the individual's voluntary control to such a degree that there are multiple hospitalizations. 2. The individual's goal is apparently to assume the "patient" role and is not otherwise understandable in light of the individual's environmental circumstances (as in the case of malingering).<sup>2</sup> Clues that should alert suspicion are when the patient has or appears to have an extensive knowledge of medicine and the functioning of a hospital ward. Frequently Munchausen's syndrome patients are former health care workers. They give a story of falsely elaborate systems and histories that intrigue the medical listener; this special story telling ability has been termed "pseudologia fantastica."<sup>4</sup>

Munchausen's patients are characteristically very demanding of staff. They occupy an inordinate amount of time yet never seem satisfied with what is offered. They are usually very willing to undergo quite dangerous therapeutic or diagnostic procedures. It is this willingness that often leads to their acquiring a "gridiron" abdomen from numerous surgical procedures. Burr holes in the skull are another common finding. The willingness to be put under the surgeon's



knife frequently leads to the patient developing real physical illness of an iatrogenic nature, i.e. bowel obstruction secondary to adhesions.

Munchausen's syndrome patients usually have few, if any, visitors during their hospitalization. The nature of their illness is incompatible with healthy interpersonal relationships. As they cannot hold steady employment, there is a tendency toward downward socioeconomic drift. Although there has been nothing in the published literature, it is possible that a variant form of Munchausen's syndrome exists where the patient works just long enough to acquire hospitalization benefits, then utilizes these benefits until they are exhausted. At that time the patient will seek new employment to gain benefits and thus repeat the cycle again.

Munchausen's syndrome is thought to begin early in adult life and to be a chronic problem. It is reportedly more common in males and is currently thought to be underdiagnosed. If the diagnosis was made more often, when appropriate, there may not be a sexual predominance. The etiology of the syndrome is unknown, there is however considerable speculation. The motivation to undergo surgical procedures has been seen as a strange erotic desire or as a means of fulfilling fantasies of parturition or symbolic castration.<sup>5</sup> Some envision Munchausen's syndrome patients as having a grudge against medicine in general, and that by manipulating the system they are deriving some grotesque sort of revenge. Others view it simply as a means to a "free roof over their heads and three square meals a day." However, one could hardly view a hospitalization involving invasive procedures as "free". To anyone involved, i.e., the patient, staff, or society in general it is certainly not "free".

It has been suggested that frequent back to back hospitalizations have been used to hide from the law. Desire for drugs could also be motivation, however it is not ubiquitous to the syndrome and is more likely just a facet of their general exploitation. Another postulation is that the patient was originally a victim of medical mismanagement and that they possibly suffer from undiagnosed, misdiagnosed, or incurable conditions. These theories possibly explain a few episodes of Munchausen's syndrome like behavior but do not explain their persistence. Whatever the motivation, the Munchausen's syndrome patient appears to get some sort of pathological enjoyment/benefit from the ongoing dramatic role as a patient.<sup>6</sup>

A variant form of Munchausen's syndrome called "Munchausen's syndrome by proxy" has been described.<sup>5</sup> This is characterized by a parent, usually the mother, fabricating a story about their child which often leads to the diagnostic evaluation or treatment of the child for whatever disease the mother feigns.

Epilepsy and seizure disorders are most common, although, bleeding from various orifices, rashes and pyrexia have also been described. Munchausen's syndrome by proxy should be suspect when a child's recurrent illness or clinical state doesn't correlate with lab data, when new symptoms are continually added to the child's condition, when the history is such that the mother is the only one around when the problem recurs, or when seizures are not controlled by use of proper medications. It is possible that Munchausen's syndrome by proxy may play a role in the etiology of the adult form of the disease, as a child is socialized into the hospital system at a young age via their mother's fabricated histories.<sup>5</sup>

Another variant of Munchausen's syndrome was described by Houghton in 1986.<sup>7</sup> It involved the patient manufacturing a story about a rare tropical disease that required treatment for the patient and home health care workers who had been assisting her. The patient gave these paraprofessional workers a sera allegedly prescribed by her doctor for them and their children. This resulted in these persons receiving about 100 injections of the fake sera. One person became quite ill from the false treatment. This twist of a Munchausen's syndrome patient using a public health system is obviously much more dangerous than the typical patient, as it involves others in their self destructive behavior.<sup>8</sup>

When Munchausen's syndrome was first described these variants were not obvious nor known to exist. It was originally outlined in four broad categories: 1) Abdominal Type (laparotomaphilia migrans) - the patient travels about having repeated operations in various hospitals only to sign out against medical advice; 2) Bleeding Type (hemorrhagica histrionica) - characterized by harrowing bleeding symptoms; 3) Neurological Type (neurologica diabolica) - the patient presents with unusual yet often convincing fits, spells, faints, anesthetics, etc.; 4) Cutaneous Type (dermatitis autogenetica).<sup>5</sup> Obviously as technology advances and the medical profession becomes more aware of Munchausen's syndrome, new variants that are equally if not exceedingly outrageous will be described.

An interesting case was reported in The New England Journal of Medicine by Dr. Addison in November of 1974, here quoted in its entirety:\*

Last May, a United States Air Force air evacuation plane from Athens, Greece, was diverted in mid-flight to take a 40-year old man to the Air Force Hospital, Wiesbaden, Germany, for uncontrollable coronary artery pain. The patient claimed to be an attorney from San Francisco, with a loose connection to the Teamsters' Union, who had had six myocardial infarctions since 1969. He had been hospitalized in Mauritius, an Indian Ocean island, for two weeks for chest pain. He left the island hospital, against medical advice, by a civilian aircraft to Paris, which was diverted to Athens because of his increasing chest pain. Upon arrival at Athens and

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\*Written by T.E. Addison and K. H. Talan, "Jet-Set Munchausen Syndrome," and printed in the New England Journal of Medicine, November 1974, Volume 291, page 1195. Used with permission.

at Wiesbaden the patient, claiming to be a retired Army sergeant, had severe chest pain associated with seizure-like activity requiring opiates for relief. His electrocardiographic pattern was unchanged, and serial enzyme studies gave normal results. The patient claimed to have had two saphenous vein bypasses at a private San Francisco hospital ("Drs. Schumway, DeBakey, and Cooley watched in the wings,"), had 32 cutdowns, an Army medical discharge for syringomyelia, an abdominal and lumbar operation for gunshot wound, and grand-mal seizures associated with chest pain, called a "seizure-pain reflex" by an unnamed San Francisco neurologist. On examination, the patient was an obese man with a 26 cm midsternal surgical scar (wire closure), and multiple cut down sites on all extremities. The deltoids and gluteal regions were indurated from numerous injections.

His short hospitalization at Wiesbaden was stormy. He refused monitoring and blood tests (offering to draw his own), threatened to leave against advice and was thoroughly abusive and obnoxious to the staff. He was knowledgeable about medical terminology, and provided eloquent descriptions of his chest pain, surgical procedures and multiple medical problems. He continually threatened us with retribution from the Teamsters' Union. He requested and spoke to security officers about a "Communist coup in India" that he had learned about on Mauritius.

Shortly after admission we became aware that in March, 1974, after an alleged flight from Mauritius to San Francisco, he had landed at London's Heathrow Airport and had been admitted to the Oxford's Radcliff Infirmary, where he was recognized by a house physician as the same patient who had made the rounds of several Paris hospitals in 1973. He eventually signed out at the Radcliff Infirmary and later out of the Air Force Hospital at Lakenheath. In England, he was last seen taking a cab to the London Airport. The patient was confronted with this information and declined psychiatric help. He quieted down, calmly dressed, and said that he would "find another hospital." Guards took him to the train station, and purchased him a ticket to the Frankfurt Airport.<sup>9</sup>

Dr. Addison concluded by warning his colleagues that his "Jet-Set" Munchausen's syndrome patient may be playing his charade at your hospital tomorrow. This is but one of numerous cases reported in the literature. Obviously, there are many others that have not been reported and many more not yet diagnosed. The presentations afforded by the Munchausen's syndrome patient are as varied as the persons who present them.

The management of these patients has proven

frustrating. Various forms of blacklisting have been proposed in hopes that these chronic "hospital hobbes" be recognized earlier. However, there are legal and ethical difficulties with such plans. Initially, it was suggested that by presenting cases in the medical literature, other physicians might be able to recognize a Munchausen's syndrome patient based on his/her history and presentation. This has proven futile, especially as the number of Munchausen's syndrome patients increases. Treatment with electroconvulsive therapy, insulin coma and hypnosis have also proven futile.<sup>5</sup> Long term psychotherapy, promoting insight to diminish self-directed negative feelings and to encourage a mature way of handling problems has been suggested as being beneficial. Strict behavior modification regimens may also be of some benefit. It is suggested by Bursten that it may be helpful to allow the patient to function on a "pseudodoctor" level by having him/her use their medical interest to teach students, do library work for a physician, or work in a lab. This allows the patient to be near psychiatric help.<sup>4</sup>

Some feel that Munchausen's syndrome is a form of borderline personality disorder and should be treated in an appropriate manner. Initially, the patient should not be confronted with evidence of factitious disease until a plan for social and psychiatric care is arranged. During the confrontation the patient should be presented with the evidence in a straight forward, non-accusational, nonpunative manner. The staff should remain sympathetic and emphasize their continuing concern for the patient's well being. A redefinition of the patient's illness should be attempted without stripping them of their defenses and ideally the patient should be transferred to the care of their ongoing therapist immediately after the confrontational experience.<sup>10</sup> Obviously, follow-up therapy is going to be fraught with disappointment for the therapist and regression on the part of the patient. However, in such situations continuity of care is important to prevent relapse into the hospital-exploiting way of life.

Munchausen's syndrome is a chronic debilitating illness that can result in harm to the patient, and is also a draw on the already overburdened area of social medicine in the US today. With funds becoming even more scarce, it is imperative that these chronic hospital abusers be identified and treated in such a fashion as to lessen the economic strain on an already strained system.

---

#### AUTHOR

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Ruth Parry, President, South Dakota State Medical Association Auxiliary

April 18-24 has been designated as National Volunteer Week. This annual week of recognition provides a reason to celebrate a very special part of our community life.

Webster defines a volunteer as "one who offers to do something of his own free will". In common practice, this has come to mean that the service is also provided free of charge. A personal observation has been that these volunteer services are provided gratis because no organizational budget could afford to pay for the true value of the service.

The volunteer is not a person who has nothing else to do. Frequently these special individuals are employed full-time, but they also have a strong commitment to community. This commitment may come through personal experience or tragedy. It may come as a result of professional involvement. It may even be through an association of family members or friends.

Each of us has a personal motive for volunteer participation. We may appreciate the sense of belonging and the sense of accomplishment as a result of group effort. We may be seeking a challenge of the unusual

or the untried. When that challenge is successfully met comes that special feeling of achievement. A volunteer position may also provide an opportunity to use skills and abilities that may not be used in a daily job. This results in personal and professional growth. A volunteer nearly always has a sense of the organizational mission and a commitment to that.

Physicians and auxiliaries alike have provided thousands of hours to local communities "of their own free will" again this year. Were it not for that commitment, hospital gift shops would close, scout troops would cease to exist, dozens of non-profit organizations would not meet their fund-raising budgets, and the Red Cross would be unable to respond to natural disasters.

During this Week of the Volunteer, allow yourselves to be thanked. You, the volunteer, are the backbone of non-profit boards of directors, the labor force for home delivered meals, the talent pool for community artistic productions, and the heart and soul of PTA. In addition, you also provide leadership and support for your professional organizations and health related agencies. Take pride in all your accomplishments. Be energized by the results. You are the key to the success.

*Ruth Parry*

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# Molecular Medicine: A Primer for Clinicians

## Part I. Essential Concepts of Human Gene Expression

*Department of Biochemistry and Molecular Biology. Edited by Ronald Lindahl, Ph.D.*

### EDITORIAL COMMENT

It is impossible for today's physician to escape the impact of molecular biology on his or her practice. The insulin prescribed for the diabetic patient may well be human recombinant insulin produced by bacteria. The counsel provided to an expectant couple may be based, in part, on the results of a Restriction Fragment Length Polymorphism (RFLP) analysis of their DNA. The prognosis of a colon cancer patient may be determined by the Polymerase Chain Reaction (PCR)-established p53 oncogene genotype of the tumor cells.

The terminology alone is enough to confuse and frustrate the practicing clinician trying to read the current issue of the *Journal of the American Medical Association* or the *New England Journal of Medicine*. Explaining to a concerned patient, why the identification of a new human gene reported in *Time* does not mean a cure for their disease tomorrow, can become impossible.

So rapid has been the explosion in applying the techniques of molecular biology to medical practice that the University of South Dakota School of Medicine's Class of 1993 began their training before the discovery of the cystic fibrosis gene or the first human gene therapy trials. They will graduate as the first generation of physicians practicing "molecular medicine". They are familiar with the basic methodology and possess an understanding of its ability to pervade their practice of medicine. Already, however, new techniques have replaced ones they learned. Moreover, ethical issues of only hypothetical interest four years ago are now reality.

What is molecular medicine? The term has appeared recently in the context of a revolution in medicine brought about by the application of the techniques of molecular biology to the practice of medicine. All aspects of medicine are affected by this revolution. Our understanding of disease etiology has expanded exponentially because of basic research using the tools of molecular biology. This has led to significant breakthroughs in diagnosis and treatment of many diseases. These in turn lead to new economic, ethical, legal and social concerns requiring discussion.

One way for the physician to understand the molecular medicine revolution is to recognize how it relates to their day to day practice. To do this requires that physicians become familiar with the terminology and methods of molecular biology at a level that is relevant to their needs. Then, they should develop an appreciation for how these methods are applied to human diseases.

Therefore, beginning in this issue of the *South Dakota Journal of Medicine* and continuing as a series in future months, the concepts and methods of molecular biology and their application as molecular medicine will be presented. Our hope is that clinicians will begin to feel comfortable with how the tools of molecular biology impact on, and can be useful in, their practice of medicine.

Ronald Lindahl, Ph.D.  
Professor and Chairman  
Dept of Biochemistry and Molecular Biology  
USD School of Medicine  
Vermillion, SD



## ABSTRACT

Molecular Medicine refers to the application of the tools of modern molecular biology to the practice of medicine. The impact of molecular medicine will be increasingly felt by the practicing clinician as increased understanding of disease etiology, significantly improved diagnostic methods and patient care techniques designed to affect a cure rather than treat symptoms.

This first paper in an on-going series provides a basic review of human gene expression as a framework for understanding how molecular medicine is irreversibly altering how clinicians will practice medicine. Subsequent papers will detail the application of molecular biology's tools to the practice of medicine.

## INTRODUCTION

Molecular medicine describes the application of the techniques of modern molecular biology to the practice of medicine. Every aspect of medicine has been affected by molecular biology. Understanding of disease etiology is expanding exponentially because of basic research using the tools of molecular biology. This has resulted in advances in bed-side medicine in the form of breakthroughs in the diagnosis and treatment of many diseases. Whether recognized or not, every practicing clinician has already had their approach to medicine altered by molecular biology.

The clinical applications of molecular medicine have their basis in the development of the techniques of recombinant DNA technology. These techniques, in turn, have their origin in the methods of biochemistry, genetics and microbiology. Modern molecular biology, therefore, is simply the merger of many different methodologies to study and manipulate genes. This first paper in our series will review some of the essential concepts of human gene structure and expression. Subsequent papers will describe some of the basic methods and techniques used by molecular biologists that are relevant to molecular medicine. We will then consider the application of molecular biology to a variety of clinical situations and see how these techniques impact on the practice of medicine. Readers are referred to any of several excellent recent publications which provide additional background information.<sup>1-3</sup>

Virtually all the techniques of molecular medicine are based on one or more properties of the nucleic acids, DNA or RNA. Recall that both DNA and RNA are long, linear polymers of unique sequences of four nucleotides. (Figure 1) In DNA the nucleotides are

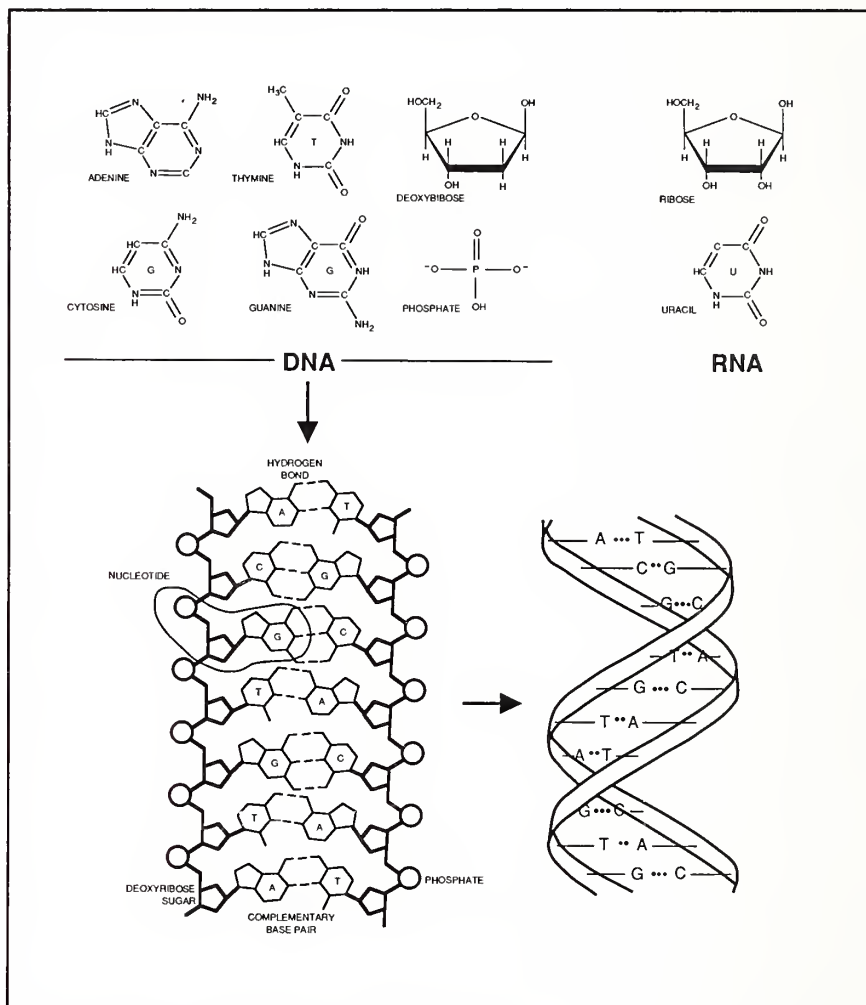


Figure 1

The structure of nucleic acids. Adapted from *DNA Science* by Micklos and Freyer with permission.

composed of the sugar deoxyribose, a phosphate group and one of four nitrogen containing bases adenine (A), thymine (T), guanine (G) or cytosine (C). In RNA, the sugar is ribose and uracil (U) replaces thymine. RNA is single-stranded, DNA double-stranded. The backbone of DNA or RNA is the repeating sugar-phosphate-sugar-phosphate structure of the nucleotides, with the bases being accessible. In DNA, the two strands are hydrogen-bonded together through specific complementary base pairs. Adenine-containing nucleotides always pair with thymine-containing nucleotides and guanines always pair with cytosines.

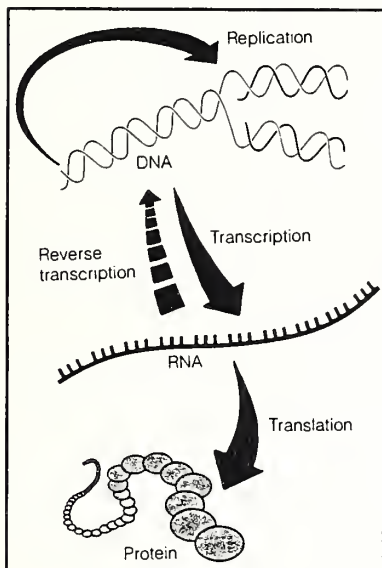
The sequence of A,T,G or C-containing nucleotides defines the genetic information content of a particular DNA or RNA molecule.

Essentially all the DNA in a human cell is located in the nucleus. However, three types of RNA are found in both the nucleus and cytoplasm of cells. Ribosomal RNA (rRNA) is a key component of ribosomes, the platforms on which proteins are synthesized in the cytoplasm. Transfer RNA (tRNA) plays an essential role in the translation of the information encoded in DNA into proteins. Transfer RNAs "read" the genetic code and place the proper amino acid into the growing protein molecule. Messenger RNA (mRNA) is the intermediate molecule that actually serves as the template for the synthesis of proteins. Messenger RNA is a faithful copy of the DNA sequence of interest. It complexes with ribosomes and is read by tRNAs into the appropriate protein sequence.

### BIOLOGICAL INFORMATION FLOW

In general the flow of genetic information in human cells is unidirectional. (Figure 2) Replication is the process of making exact, new copies of a DNA molecule. Usually this process occurs once in the life of somatic cell. The production of gametes also requires DNA replication. The process of making an RNA copy off a DNA template is referred to as transcription. Although all three RNA types are transcribed from DNA, the term transcription is most often applied to the synthesis of mRNAs. The conversion of the sequence of nucleotides in the mRNA into the proper amino acid sequence is called translation. Occasionally, an RNA molecule can serve as the template for the synthesis of a double-stranded DNA copy. This process is called reverse transcription. It is the basis of some very important methods used by

m o l e c u l a r  
biologists.



**Figure 2**

Information flow in biological systems. Adapted from *Biochemistry* by Mathews and van Holde with permission.

The language of nucleic acids, the nucleotides, encodes the language of proteins, the amino acids. The translation of nucleotides into amino acids is based on the genetic code. The genetic code consists of 64 three nucleotide long sequences or "codons". The codons represent all the possible ways of arranging the four nucleotides in sequences

| TABLE I<br>Key Terms Used in Molecular Biology |  |
|--|--|
| Replication                                    | Synthesis of new DNA from parental DNA template  |
| Transcription                                  | Synthesis of messenger RNA (mRNA) from DNA template  |
| Translation                                    | Synthesis of protein off mRNA template using ribosomes, transfer RNAs and amino acids  |
| Genetic code                                   | Three base sequences (codons) in mRNA which specify which amino acids are incorporated into protein during translation   |
| RNA processing                                 | Conversion of initial product of transcription into functional mRNA capable of being translated. Involves removal of intervening sequences and addition of poly A tail |
| Exons  | Portions of a gene that contain protein-coding sequences. Processing splices exons together by removing intervening sequences  |
| Introns  | DNA sequences that separate exons in DNA or pre-mRNA. Removed by processing  |
| Gene   | DNA sequence that codes for biologically important information, usually a protein  |
| Promoter                                       | Portion of gene involved in regulating its expression. Usually consists of several sequence elements recognized by DNA-binding proteins                                |
| Transcription factors                          | DNA-binding proteins that interact with promoter sequences to control gene expression  |
| Allele   | Alternative forms of a gene  |

of three. Each three base sequence in a mRNA specifies that a particular amino acid be inserted into the growing protein molecule during translation. Therefore a mRNA can be viewed as a long sequence of codons, the order of which defines the protein to be produced by that mRNA. Of the 64 codons, 61 actually specify an amino acid. Three codons determine when protein synthesis stops. One of the 61 coding triplets also defines the location on the mRNA where translation will begin.

**DNA Replication.** Within the nucleus, DNA exists associated with a variety of proteins, largely histones, as chromatin (Figure 3). The basic structure of chromatin is the nucleosome. This structure is composed of long DNA helices wrapped around histone complexes at regular intervals. In non-dividing cells chromatin exists as extended strands of nucleosome complexes in which the DNA is accessible to the replication or transcription machinery. In dividing cells, chromatin is highly condensed and tightly packaged into chromosomes. Thus, there are as many chromatin molecules as there are chromosomes.

Because there are only 46 chromosomes in man, and approximately 50,000 to 100,000 different genes, each



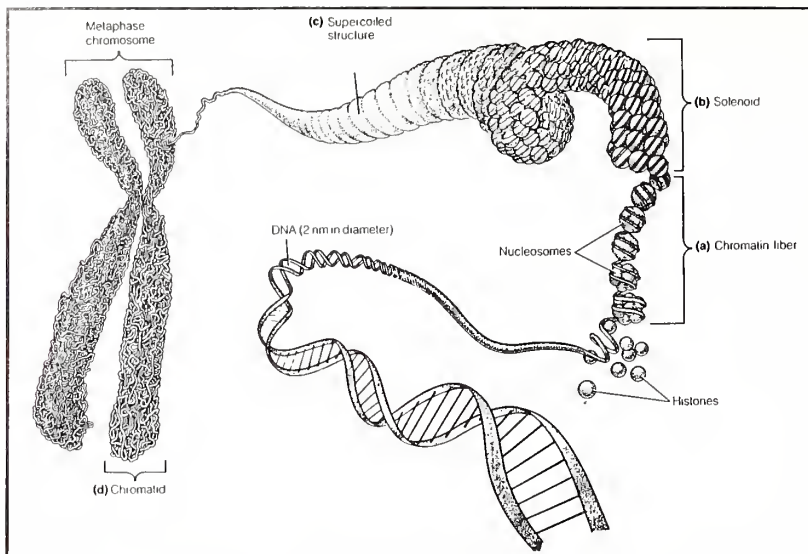


Figure 3

The organization of DNA into a chromosome. Adapted from *Biochemistry* by Mathews and van Holde with permission.

chromosome contains several hundred to thousand genes in its DNA sequence. Not only is the total number of genes large, but each gene is present in at least two copies, or alleles, one obtained from the mother and one from the father. The two copies may be the same (homozygous) or they may be different (heterozygous). Our genetic diversity comes from the random combination of alleles at conception.

DNA replication results in the production of two identical daughter DNA helices from a single parental helix. (Figure 4) Replication occurs from many sites on the chromatin molecule simultaneously. The replication process is enzymatic and each strand of the helix serves as a template for the synthesis of an exact complementary copy based on the nucleotide sequence of the template (semiconservative replication). The major DNA replicating enzyme is called DNA polymerase. The replication process has directionality. DNA polymerase can only add the next nucleotide to the hydroxyl group on the number 3 carbon of the deoxyribose sugar of the previous nucleotide. If the 3' hydroxyl group is not present, replication stops. One method of sequencing DNA relies on the presence or absence of this 3' hydroxyl group. As newly replicated DNA is formed, it is immediately organized into nucleosomes by complexing with histones.

**Transcription and Messenger RNA.** Like replication, transcription of RNA off a DNA template occurs in the nucleus. (Figure 4) The transcription process is very similar to replication because transcription occurs from specific starting points and an exact complementary copy of the DNA template strand is produced, based again on complementary base pairing of A and U, and G and C-containing nucleotides. Since an RNA molecule is produced from DNA, the enzymes involved in transcription are referred to as RNA polymerases. All

three types of RNAs, messenger, ribosomal and transfer, are produced by the same transcription process.

Production of a functional RNA is a complex process. (Figure 5) What is actually transcribed off the DNA template in the nucleus is usually much larger than the RNA found in the cytoplasm as part of a ribosome or as transfer or messenger RNA. The events which result in the production of a functional RNA molecule from its primary transcript are referred to as RNA processing. Processing takes place in the nucleus and must be completed properly for the RNA to leave the nucleus and assume its proper role.

The discovery of RNA processing, especially of mRNAs, was an important contribution to our current knowledge of the structural organization of genes in higher organisms. Prior to the identification of processing, it was assumed that

the organization of genes was identical in all organisms, whether bacterial or human. In bacteria the DNA (or mRNA) and protein sequences are colinear. If the sequence of one is known, the sequence of the other can be deduced directly because every nucleotide is part of a codon of the genetic code.

However, the primary transcript that gives rise to a mRNA in a human cell is much longer than the final product. Comparison of the primary transcript and the final mRNA by any number of techniques indicates that the protein encoding nucleotide sequence, which is continuous in the mRNA, is interrupted by non-amino acid coding nucleotide sequences in the primary transcript. (Figure 5) These non-coding sequences, called intervening sequences or "introns", are excised out of the primary transcript so that the final mRNA sequence is colinear with the resulting amino acid sequence of the protein. The amino acid coding regions of the nucleotide sequence are called "exons".

Since the primary transcript is copied directly from the DNA template by RNA polymerase, the DNA sequences that encode a particular bit of biologically important information, i.e. a protein, must also be interrupted by introns. (Figure 5) Thus, in higher organisms, a protein and the DNA sequence encoding it are not colinear. In these organisms, the information to produce a particular product, while still a discrete unit with well-defined boundaries, exists in smaller units, the exons, interrupted by one or more introns. The majority of, but not all human genes, consist of this split, intron-exon organization. Virtually all tissue-specific and many "housekeeping" genes have this organization. The number of introns is specific for each gene; some genes may have a single intron, others many contain several dozen. However, other housekeeping genes, including those encoding the histones, lack in-

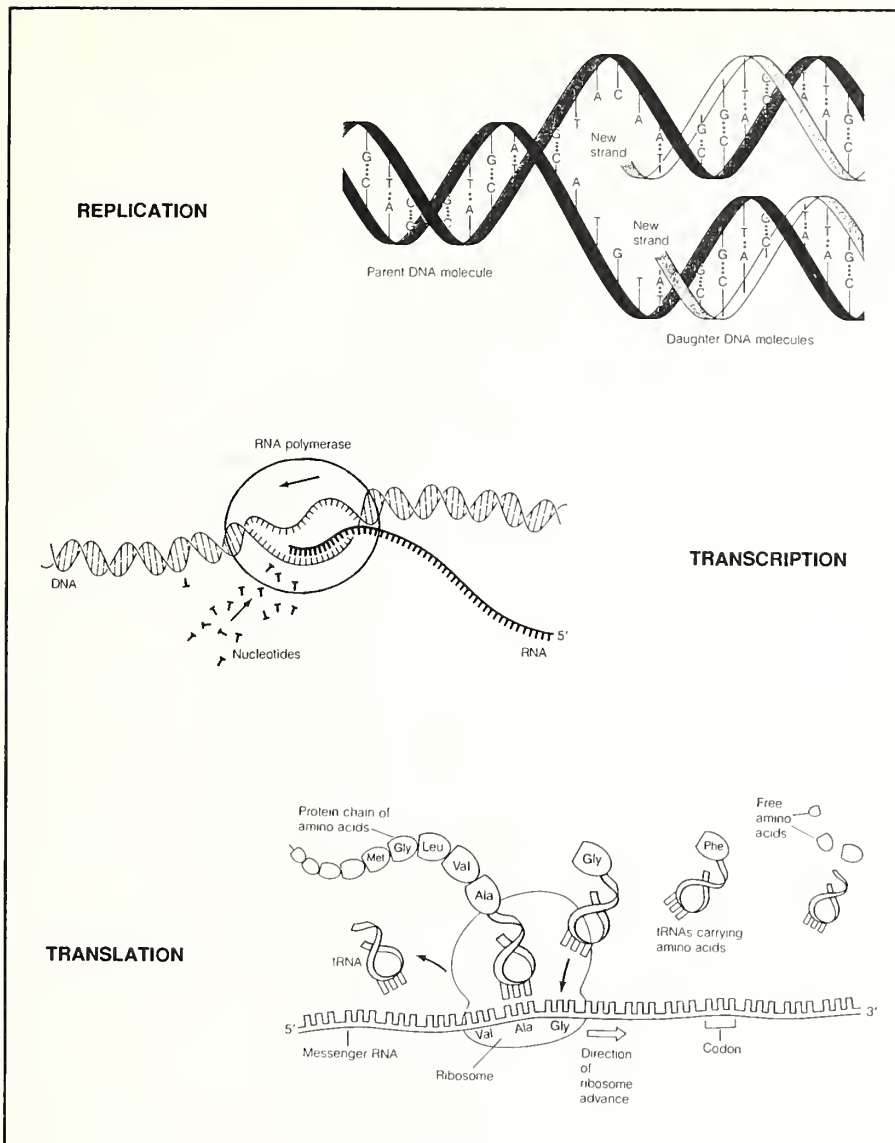


Figure 4

The process of DNA replication, transcription into RNA and mRNA translation into protein. Adapted from *Biochemistry* by Mathews and van Holde with permission.

tron sequences so that the DNA and protein sequences are colinear. The presence of introns can be a confounding variable in many molecular biology methods.

The removal of introns occurs during primary transcript processing. (Figure 5) The border of an intron and its adjacent exons are usually defined by specific nucleotide sequences. The removal process requires the recognition of the appropriate intron-exon boundary, the breaking of the sugar-phosphate backbone at both ends of the boundary and exact rejoining of the two exons to assure that the proper protein coding sequence is created. This

process is called "splicing" and for mRNA, processing is enzymatic. It is not difficult to appreciate that errors in splicing can result in changes in the information content of the resulting mRNA if even one extra nucleotide is left in the mRNA or an extra nucleotide is excised. It is not readily apparent why the genes of higher organisms are organized so differently from those of bacteria, since many other similarities exist at the molecular level between these very diverse organisms. Clearly, however, evolutionary pressures have maintained this organization, indicating that it is quite important.

**Translation into Protein.** In contrast to transcription and RNA processing, the translation of an RNA sequence into an amino acid sequence is basically identical in bacteria and higher organisms. (Figure 4) One key to this similarity is that translation always uses the same triplet genetic code. This is true whether the messenger RNA comes from bacteria or from man and whether the protein is being synthesized by a bacterial cell or a human cell. This means that the same tRNAs recognize the same codons and incorporate the same amino acids into the growing protein regardless of their source. The ribosomes of bacteria and mammals are also capable of

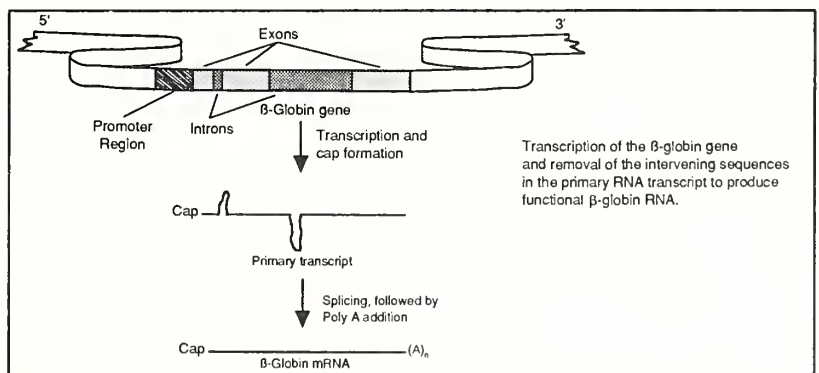


Figure 5

The production a functional mRNA. This example describes the synthesis and processing of human  $\beta$ -globin mRNA. The loops in the primary transcript represent intron sequences being removed. Adapted from *Biochemistry* (3rd Ed.) by Stryer with permission.



translating any mRNA, regardless of its source.

Some of the differences in translation between bacteria and mammals are important clinically. Differences in antibiotic sensitivity of various components of the protein synthesizing machinery allow specific inhibition of either bacterial or mammalian cell translation. However, the similarities are very important to the molecular biologist. As we shall see in future months, they allow bacteria to serve as "factories" for the synthesis of human proteins by recombinant DNA technology. The similarities also provide one means of isolating and characterizing individual human genes.

## REGULATION OF GENE EXPRESSION

The DNA sequences on either side of the protein-coding portion of a human gene are also very important. (Figure 6) The sequences in front of ("5' to" or "upstream" of) the first exon are called the promoter region of the gene. The promoter region contains additional DNA sequences that are important for proper transcription of the gene. Promoters can vary greatly in length and sequence complexity, depending on the particular gene. Housekeeping genes, those that are expressed in all cells at all times, usually have relatively simple promoter regions. Most genes, however, can have their transcription rates regulated so that tissue or developmental specificity of gene expression can occur. The promoter regions of these genes are usually more complex. Most promoter regions contain nucleotide sequences which help the RNA polymerase find and bind to the specific start site for transcription of the proper mRNA ("TATA" and "CAAT" boxes). The 3' or downstream regions of genes may also contain important regulatory elements. Most human mRNA transcripts require the addition of long sequences of adenine containing nucleotides to their 3' ends as part of processing. The signals for adding the poly A tail are specific nucleotide sequences.

In addition, other nucleotide sequences in the promoter region are recognized by other proteins called transcription factors. Some transcription factors confer tissue- or developmental-specificity on gene expression. For example, the globin genes are only expressed in red blood cell precursors because only these cells possess the right set of transcription factors to recognize and activate the globin gene promoters. Conversely, some products of oncogenes (cancer genes) are transcription factors that can activate promoters of genes that control cell growth, resulting in their inappropriate expression and neoplasia.

Alternatively, changes in promoter sequences (mutations) can alter the binding of transcription factors, leading to inappropriate gene expression. It

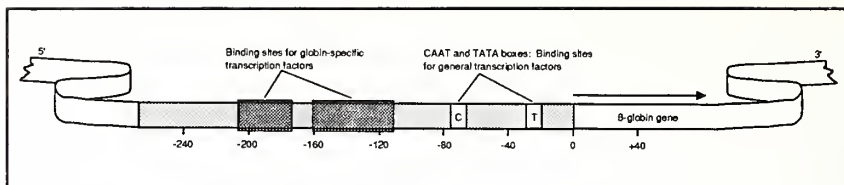


Figure 6

The organization of a typical human gene regulatory region. This example is the promoter region of the B-globin gene. The stippled region defines the promoter region 5' to the transcription start site (arrow). The hatched areas represent regions involved in binding globin-specific transcription factors. C and T represent CAAT and TATA sequences. Numbers are nucleotides, with 0 representing the nucleotide which defines the start site for mRNA transcription. Adapted from *Biochemistry* by Mathews and van Holde with permission.

should be apparent that control of human gene expression can be very complex and that multiple levels of regulation, or "cascades" involving the regulation of transcription factor genes which then regulate their target genes, are possible.

The preceding discussion allows us to develop two definitions of a human gene. These will be important in our future discussions of molecular medicine. At the functional level, a gene is a sequence of nucleotides in a DNA molecule that encodes biologically important information. This information is usually expressed ultimately as a protein. Structurally, a gene is a discrete region of DNA that encodes a product, again usually a protein. Most often, it consists of protein-coding sequences interrupted by introns. On either end of the protein encoding region are sequences that control expression of the gene, the promoter and other regulatory elements. The entire structure is called a transcription unit or gene. Depending on the gene, a single transcription unit may span several hundred to several hundred thousand base pairs in a DNA molecule.

In the upcoming months, we will describe the techniques used to isolate and characterize a single human gene from among the 50,000 or so genes distributed among our 46 chromosomes. Then we will see how the tools of molecular biology can define the function of a newly identified gene and how that information is used in the practice of molecular medicine.

## AUTHORS

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# South Dakota Foundation for Medical Care

## Quality of Care Review Process

South Dakota Foundation for Medical Care (SDFMC), the physician peer review organization for South Dakota, reviews medical records to assess quality of care. By applying generic quality screens to completed medical records, nurse reviewers determine whether or not a physician is required to review the case.

The physician reviewer, when requested to assess the medical record, is asked to identify all potential quality issues. HCFA has outlined potential quality issues into the following ten categories:

1. Apparent failure, on admission, to establish an adequate data base. (Example: Failure to record a prompt and adequate history and physical exam or failure to identify known comorbid diagnoses, risk factors, or other conditions requiring attention.)
2. Apparent failure, on admission, to establish initial diagnoses, important possible alternative diagnoses, or problems requiring further evaluation.
3. Apparent failure, on admission, to establish, develop, and/or execute an appropriate diagnostic, treatment, and/or monitoring plan for a defined diagnosis, problem, and/or risk. (Examples: Excessively radical surgery planned for breast tumor; thrombolytic therapy not ordered for appropriate patient with heart attack.)
4. Apparent failure, during the stay, to document clinical signs, symptoms, and test results. (Example: Failure promptly or accurately to perform tests; failure to collect monitoring data that have been ordered.)
5. Apparent failure, during the stay, to timely and correctly notice and interpret evolving clinical signs and symptoms or the results of laboratory tests or imaging studies. (Example: A glucose of 430 is not mentioned in progress notes; 3-day delay in response to progressive decrease in urinary output.)
6. Apparent failure, during the stay, to institute timely and/or appropriate clinical management of complications, newly established diagnoses, or evolving clinical state. (Example: Patient who developed ventricular arrhythmia not ordered placed on monitor; appropriate consultation not ordered.)
7. Apparent failure, in relation to discharge, to document clinical signs and other evidence of readiness for discharge. (Example: Predischage vital signs and functional status not found in chart.)
8. Apparent failure, in relation to discharge, to correctly interpret clinical signs, symptoms, and test results, with regard to readiness for discharge. (Example: No consideration in chart of a new temperature elevation or low blood pressure occurring before discharge.)
9. Apparent failure to initiate appropriate rehabilitation and/or discharge planning. (Example: No home nursing visit ordered for disabled patient with new colostomy.)
10. Apparent failure, at anytime, to meet other quality standards not fitting the categories above.

Through HCFA has categorized potential quality issues, it is only through the physician peer review process that a potential quality issue can be confirmed as a problem.

Appropriate attention to thorough documentation will avoid unnecessary referral. Appropriate attention to the patient's clinical signs, symptoms, and test results upon admission, during the stay, and at discharge should result in quality patient care.

Gerald Tracy, MD  
Medical Director



### Recent Changes in Recommendations for Antihypertensive Therapy

James R. Clem, Pharm.D., Sioux Falls

Over the past two decades, the Joint National Committee (JNC) on Detection, Evaluation, and Treatment of High Blood Pressure has published periodic consensus statements on various aspects of high blood pressure, including prevention and treatment. During the last twenty years there has been a substantial decline in mortality secondary to stroke and coronary heart disease.<sup>1</sup> In contrast, over this same time period the overall mortality rate due to noncardiovascular disease has not fluctuated much at all. Both the detection of hypertensive patients and the number of patients who have effectively controlled their high blood pressure have increased.<sup>1-3</sup> Therefore, much of the credit for the reduced cardiovascular mortality rate has obviously been attributed to reduction in high blood pressure. The area of pharmacologic therapy of hypertension has some significant changes with the most recent consensus statement (JNC V).

In order to discuss the therapy of high blood pressure, it is necessary to restate the overall treatment goal in hypertensive patients, which is to prevent morbidity and mortality due to elevated blood pressure and to control blood pressure without the occurrence of intolerable or bothersome adverse effects.

As in previous years, the initial therapy for most patients is life style modifications (non-pharmacologic therapy). There haven't been any major changes to this mode of therapy, which consists of weight reduction, moderation of alcohol consumption, regular physical exercise, cessation of smoking, maintenance of adequate potassium, calcium, and magnesium intake, and reduced sodium intake. The recommendations for the initial pharmacologic therapy have changed considerably since the consensus statement five years prior.

The 1988 JNC IV recommendations were considered a breakthrough due to the fact that for the first time JNC abandoned the "maximize the drug dose" approach in treating high blood pressure.<sup>4</sup> At that time, the committee's suggestions focused on doing away with the traditional approach of giving one agent until maximum doses are reached then add a second, then a third agent, etc. The 1988 guidelines suggested that antihypertensive therapy needs to be well tolerated by the patient, therefore maximum doses need not be achieved in order to add a second agent, or a third. The rationale for this was the desire to reduce adverse effects secondary to the antihypertensive therapy. Additionally, the 1988 statement recommended that classes of drugs that had been reserved for second-line therapy (calcium-channel blockers and angiotensin

converting enzyme [ACE] inhibitors) could now be used first-line, due to their proven effectiveness in lowering blood pressure. Finally, the concepts, "tailored therapy" and "step-down therapy" came into vogue and are still considered extremely important aspects of current antihypertensive therapy recommendations.

In the new recommendations (JNC V, 1992), diuretics and beta-blockers are considered the preferred agents for initial treatment of hypertension.<sup>1</sup> The driving force behind this recommendation is the simple fact that beta-adrenergic blockers and diuretics have demonstrated a reduction in cardiovascular morbidity and mortality in clinical trials.<sup>1,5</sup> The alternative agents for the initial treatment of hypertension include calcium-channel antagonists, ACE inhibitors, alpha<sub>1</sub>-receptor blockers, and the alpha-beta-receptor blocker.<sup>1</sup> Unfortunately, none of the alternative agents have been studied as to their effects on lowering cardiovascular morbidity and mortality associated with hypertension.<sup>1</sup> The alternative first line agents should be reserved for specific indications, "tailored therapy", or when diuretics and/or beta-adrenergic blockers are ineffective or intolerable. "Tailored therapy" results from the use of an antihypertensive agent that is beneficial not only to hypertension, but also another of a patient's disease states. An example of this would be a patient who has a long standing history of hypertension and has been recently diagnosed with congestive heart failure. Depending on the type of heart failure, beta-blockers may be relatively contraindicated. Conversely, an alternative antihypertensive agent such as an ACE inhibitor would benefit both disease states and would therefore be the agent of choice in that case. Numerous other "tailored therapies" exist for these special patient populations and the reader is referred to the published guidelines.<sup>1</sup>

Cost is another reason the recommendations focus on diuretics and beta-blockers as initial therapy.<sup>1</sup> These two classes of drugs are by far the most inexpensive of the antihypertensive agents. Many of the newer agents in the other classes, calcium-channel blockers and ACE inhibitors, are simply "me too" agents which don't offer any advantages to agents already on the market in their respective classes. The comparative safety and efficacy of the numerous newer agents within a given class are so similar that the predominant decision-making factor of which agent to use comes down to cost of each individual agent.

Another major issue in the JNC V guidelines deals with adherence to therapy (previously termed patient compliance). The consensus statement provides very helpful insight into identifying problems of patient adherence and how to solve these types of problems. For detail, the reader is again referred to the consensus statement.<sup>1</sup>

In conclusion, the hypertensive treatment guidelines created by JNC V are important reading for those who manage patients with hypertension. Hopefully, following these guidelines will facilitate a continued upward trend in patient outcomes. This is highly recommended reading.

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Edited by Brian Kaatz, Pharm.D.



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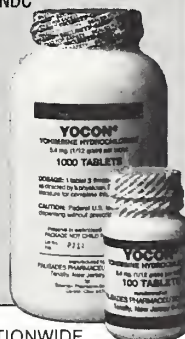
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#### References:

1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
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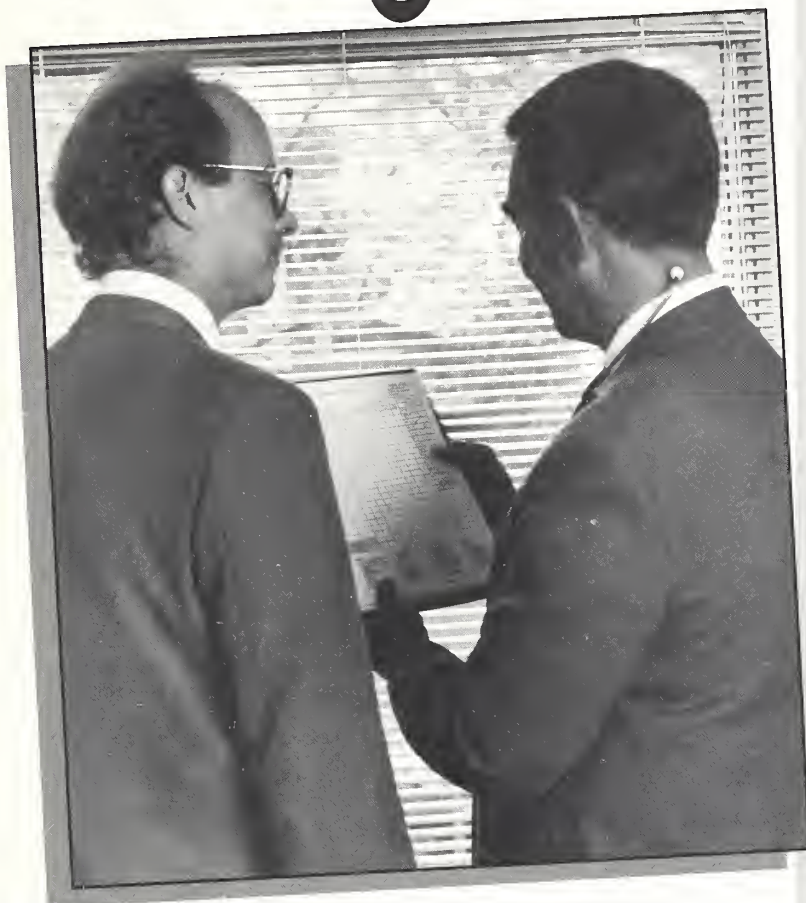
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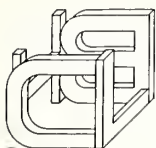
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## How Well Do You Manage Your Malpractice Risks? - Part I

(This is the first in a two-part series of articles on risk management submitted by the Risk Management Committee of the Midwest Medical Insurance Company (MMIC). MMIC is a physician-owned professional liability carrier providing coverage for physicians in South Dakota, North Dakota, and Minnesota.)

"Frequently, a medical malpractice claim boils down to errors made outside the clinical aspect of a patient's care. A breakdown in communication that contributes to a patient's injury is a problem we see all too often."

Kathy Hoskins  
Malpractice Defense Attorney  
Hoy & Hoy, Sioux Falls

Although there is no question that the malpractice climate is more favorable for South Dakota physicians than for those physicians practicing in New York or Florida, malpractice claims continue to be a serious concern. Analysis of malpractice claims nationwide, as well as in South Dakota, shows that the non-clinical components of medical practice continue to be a major cause of patient injuries, malpractice claims, and expensive claim losses. Inadequate methods of documentation, lax handling of patient information, poor patient relations, and other nonclinical factors have resulted in millions of dollars in indemnity payments on claims that should have been preventable.

MMIC's risk management self-survey allows physicians to evaluate their own malpractice risks. Part I emphasizes communication and patient relations. Part II, to appear in the next issue of the South Dakota Journal of Medicine, highlights documentation, medical record handling, and follow-up systems.

The questions are all written to elicit a "yes" answer if appropriate risk management mechanisms are in place. Any "no" response should trigger closer analysis of the issue and, probably, remedial action to improve risk management protections.

### I. PATIENT RELATIONS

Plaintiff attorneys report that a large majority of the patients who seek legal assistance to file a malpractice claim do so because they are angry; angry not just because of an adverse medical outcome, but because of breakdowns in communication, long waits, physicians' failure to provide information, or other nonclinical factors that create a perception of lack of care, concern, and respect for the patient.

Good patient relations—particularly open communication and rapport—are the best defenses against the filing of malpractice claims.

Evaluate your practice on these issues of patient relations:

|  | <u>Yes</u>                      | <u>No</u>                       |
|--|---------------------------------|---------------------------------|
| 1. I listen closely to patients' explanations, questions and concerns about their medical problems without interrupting unnecessarily.   | ___                             | ___                             |
| 2. As appropriate, I sit down when I am talking with patients in the exam room so they do not feel as though I am trying to "rush off" to somewhere else.  | ___                             | ___                             |
| 3. I make sure I am notified of all patient complaints concerning their medical treatment.   | ___                             | ___                             |
| 4. I have developed realistic scheduling guidelines for various types of appointments to avoid back-ups and long waits for my patients.  | ___                             | ___                             |
| 5. It is likely my patients view me as:<br>a. Caring and concerned.<br>b. Familiar with their medical history.<br>c. A good listener.<br>d. Approachable, non-threatening.<br>e. Willing to spend adequate time with them. | ___<br>___<br>___<br>___<br>___ | ___<br>___<br>___<br>___<br>___ |
| 6. I avoid "jousting"—making disparaging comments to patients about other health care providers.   | ___                             | ___                             |

### II. COMMUNICATION WITHIN THE CLINIC

As medical practice has become increasingly complex, the potential for patient injuries and related malpractice claims caused by communication failures within clinics has grown dramatically. The larger and more fragmented medical care becomes, the more critical it is for physicians to participate in well-organized internal communication systems to ensure that the entire health care team is working in concert to provide safe, efficient patient care.

Evaluate your practice on these issues of internal communication:

|  | <u>Yes</u> | <u>No</u> |
|--|------------|-----------|
| 1. I participate in regular meetings with clinic administration and staff to help identify and resolve problems that may have an impact on patient care. | ___        | ___       |
| 2. I comply with all established clinic policies and procedures.   | ___        | ___       |

III. COMMUNICATION WITH OTHER PHYSICIANS

As medical care has become more specialized and physicians rely more on referrals and consultations, good communication between physicians has become critical to prevent patient injuries. Communication breakdowns between referring and consulting physicians are frequently at the heart of malpractice claims.

Evaluate your practice on these issues of communication between physicians: Yes No

- 1. When making referrals to, or requesting consultations from, other physicians, I provide adequate clinical information about patients to give a complete picture of the services the patients require.
- 2. I provide adequate clinical information about patients when requesting X-rays to allow the radiologist to determine the views necessary to take.
- 3. When I provide consultations, I make certain that the referring physicians are directly and promptly notified of critical findings.
- 4. I make certain that it is clearly designated who will take ongoing responsibility for the patient when there is more than one physician involved in a patient's care.
- 5. I inform physicians who are covering for me about difficult cases and potential problems that may arise while they are on call.

IV. CONSENT

Failure to obtain informed consent can create significant difficulties in the defense of malpractice claims. Obtaining patients' informed consent to treatment need not be a difficult process, yet it can be a very beneficial element of the physician-patient relationship.

Evaluate your practice on these issues of informed consent: Yes No

- 1. I discuss the major risks, benefits and alternatives with patients when recommending treatment involving significant risks rather than delegating this task to an allied health professional.
- 2. I attempt to discuss recommended procedures with patients at a time and place conducive to a good exchange of information and questions.

- 3. I document my informed consent discussions in patients' medical records.
- 4. I ensure that I have obtained appropriate consent for the treatment of minors.

This self-survey addresses many of the risk management issues seen most frequently in malpractice claims, but cannot cover all possible problems that could lead to patient injuries or lawsuits. Allow the survey to stimulate other questions about areas of concern that may pose additional liability exposures in your own practice. Once identified, most risk management concerns are easily addressed. Improvements in the areas highlighted by the survey not only reduce your malpractice risk but also serve to increase patient satisfaction and raise the level of quality of care.

For a copy of the complete survey from which this article was derived, contact Shirley Qual, MMIC Associate Risk Management Consultant, at 1-800-328-5532.



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# Extenuating Circumstances

## The Specialty Dilemma

Richard P. Holm, MD

An elderly patient I know was transferred to the tertiary care hospital for mitral valve replacement. Her postoperative course was a catastrophe with one organ system failing after another. The specialists were called for in order...and by the time she died, she had been dragged through respiratory, renal and cardiac support systems until her body gave up by sheer exhaustion. During all of this, the family felt like they had no one to talk to about stopping the efforts. There appeared no captain of the ship. Of course, the specialists were concerned and cared but there were too many opinions, no coordinator and no communicator. It was a bad experience and it cost a small fortune.

The hospitalized and extremely ill patient (and his/her family) in the United States of America commonly experiences the benefit of multiple specialists. This allows the expertise and perspective each specialist has to offer for managing the patient. It is this specialized care that brings us to the cutting edge of technology providing the finest medical care to the people who live here. We want only the absolute best for ourselves, for our family, for our patients.

However, in this very ill patient highly specialized scenario, it is common that there is inadequate personal interaction with the patient and the family by the physicians. Sometimes care can become fragmented when there is no one defined as coordinator resulting in excessive, invasive, expensive and even unwanted testing and treatment.

The primary care provider who would be the obvious choice as coordinator and communicator has often been left out of this acute care hospital picture. The United States Health Care Financing Administration (HCFA) has taken steps recently to exclude the primary care physician for following a hospitalized patient unless there is a specific "diagnosis" for which no one else is seeing the patient. What is more, many coronary and intensive care units require for admission "automatic consultation" by an intensivist and/or cardiologist. This virtually puts the patient in the hands of strangers and often takes the patient's own physician out of the equation.

Having no defined physician coordinator is one real cause in the U.S. for the run away cost of medicine—I think a result of too many sub-specialists and not enough primary care physicians. This condition is self-perpetuating since medical students are not enticed into primary care when they see little role and reimbursement for the primary care physician in treating a hospitalized patient.

## What should be done:

1. Research should be initiated to evaluate the prevalence and consequences of this "condition". Some of this has already been done but it needs to be brought together and highlighted.
2. Hospital policies should clearly define the coordinating role of the attending (primary care) physician and clarify that physician as being **chosen by the patient**. This attending physician should be the designated person to request a consultation and to define the role and scope of that consultation. The attending (primary care) physician, who may sometimes even be a "specialist", should **coordinate the management** with the assistance of the consultant(s). This should occur in the ICU/CCU as well as on the wards.
3. Every effort should be made to encourage HCFA, insurance carriers and third party payers to reimburse physicians for coordinating care and interacting with the patient and the family. There should be no need to prove a separate diagnosis for which to justify that attending physician's involvement.
4. Medical schools, family practice and internal medicine residency programs and all sub-specialty programs should be coordinated by one national organization so as to have a national "needs driven" plan. Fiscal incentives should be the mechanism to bring medical students into training programs to fill the national needs.
5. Fee-for-service must be preserved for primary care. If procedures/proceduralists are salaried then a great deal of savings will occur. But when primary care is salaried something will happen to the service. Patients won't be happy,\* access will diminish, and even fewer med students will choose primary care as their field.

Fee-for-service for primary care, to include the coordination of acute care, is a crucial part of the formula for successful health care reform.

---

\*August 1992 issue of Consumers Reports

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Room 303

Diane Mair, RN, Sioux Falls, SD

*Hurry, hurry, room 303 is failing fast  
In the middle of the night.  
Work quickly, smoothly, silently.  
Start the I.V., lift up the head,*

*Glide through the darkened corridors  
To the intensive care unit—  
Foreign sounds, flashing lights.*

*Someone's wife, lover, mother  
Is failing fast  
In the middle of the night.  
tissue paper skin, wrinkled face  
And faded blue eyes  
Picturing the past.*

*Let our eyes never meet  
For then I will know  
That it is not your death I fear,  
But that I may be next in line.*

#### AUTHOR

Diane Mair, RN is a nurse at Sioux Valley Hospital, Sioux Falls. She wrote this poem in response to issues raised at an Augustana College Masters Seminar dealing with ethics and health care.



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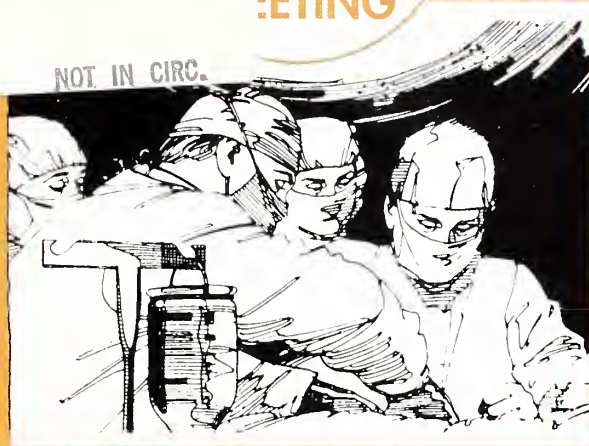
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## Today's Pork: Compare it to chicken for a healthy surprise

You may not have considered pork to be a healthy choice for your patients on fat-modified diets. But today's fresh pork compares surprisingly well to chicken in total fat, saturated fat, cholesterol, and calories.<sup>1,2\*</sup>

|   | Calories | Total Fat | Saturated Fatty Acids | Cholesterol |
|---|----------|-----------|-----------------------|-------------|
| Chicken Breast, skinless                | 140      | 3.0 g     | 0.9 g                 | 72 mg       |
| Pork Tenderloin, trimmed                | 133      | 4.1 g     | 1.4 g                 | 67 mg       |
| Pork Top Loin Roast (boneless), trimmed | 160      | 6.4 g     | 2.4 g                 | 66 mg       |
| Center Loin Chop, trimmed               | 165      | 6.9 g     | 2.5 g                 | 70 mg       |
| Chicken Thigh, skinless                 | 178      | 9.2 g     | 2.6 g                 | 81 mg       |

\*Table refers to 3-oz. cooked (roasted) servings.

## New study: Pork is now 31% leaner


Pork is leaner today because of significant changes made in breeding and feeding techniques.<sup>1</sup> According to a new study conducted in cooperation with the USDA, fresh pork contains an average of 31% less fat after cooking and trimming than the same cuts reported in 1983.<sup>1</sup>

Today's pork fits well within the dietary guidelines recommended by both the American Heart Association and the National Cholesterol Education Program. Here's some advice to help patients on low-fat diets enjoy the variety, extra taste, and versatility of pork:

- Choose the leanest cuts. Shop for cuts with "loin" in the name.
- Trim away any visible fat.
- Keep portions moderate (about 3 oz, cooked).
- Prepare by broiling or roasting, and avoid additional fat in preparation.

1. Buege DR, et al. *A Nationwide Survey of the Composition and Marketing of Pork Products at Retail*. University of Wisconsin; 1990.

2. US Dept of Agriculture. *Composition of Foods: Poultry Products*. Washington, DC: US Govt Printing Office; 1979. Agricultural handbook 8-5.



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# SOUTH DAKOTA JOURNAL OF MEDICINE

Volume 46/No. 5 May 1993

(ISSN 0038-3317)

Official Publication of the  
South Dakota State Medical Association  
the South Dakota Chapter of the  
American College of Surgeons  
the South Dakota Psychiatric Association  
of the American Psychiatric Association

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SOUTH DAKOTA JOURNAL OF MEDICINE (ISSN 0038-3317) is published monthly by the South Dakota State Medical Association, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Subscription price: \$15 per year domestic, \$18 per year foreign, \$1.75 for single copy. Second class postage paid at Sioux Falls, South Dakota 57101 and additional mailing offices. POSTMASTER: Send address changes to SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105.

NATIONAL ADVERTISING: Contact State Medical Journal Advertising Bureau, Inc, 711 South Boulevard, Oak Park, Illinois 60302. Phone: 708-383-8800.

LOCAL AND CLASSIFIED ADS: Contact Jeri Spars, SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Phone: 605-336-1965.

PRINTER: The Ovid Bell Press, Inc, PO Box 370, Fulton, Missouri 65251-0370.

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## NEXT MONTH

Despite Intensive Efforts, Egg-Related  
Salmonellosis Outbreaks Continue

## About the Cover

The upcoming annual meeting of the South Dakota State Medical Association, June 10-12, 1993, will be held at the Ramkota Inn in Sioux Falls, SD.



# CONTRIBUTORS NEEDED!

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**M. George Thompson, DO, President**  
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**M**y last President's Page and still so much to write about. When taking the oath of office I mentioned that I was a political conservative. After watching daily what the federal government is trying to do to medicine, I see no reason to change my philosophy. The main problem this year is that when I am at district meetings and national forums it is like preaching only to the choir.

To paraphrase a quote I read the other day which describes an incident that actually happened it goes like this: When a doctor was asked the question "Do you think the reason medicine is in trouble is ignorance or apathy"; he answered, "I don't know and I don't care." Thankfully, there is a majority who do know and do care.

A leadership position is just that. You can only spread the agenda of the State Medical Association. Of

course you have a forum to influence those views but to a very small amount. A successful year in this office is hard to measure. Various groups keep coming at us every year with the same or only slightly changed initiatives. The struggle will never end. This coming year appears to be shaping up as the mother of all battles. Ignorance and apathy have no place. Becoming informed and fighting to save medicine as a single voice is our only hope.



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# Determinants of Peak Flow Rate Among Hutterite Farmers

*Emily Ferguson, MS II, Rodney R. Parry, MD, and Evelyn H. Schlenker, Ph.D*

## ABSTRACT

Observations from respiratory studies of over 1000 Hutterites and 200 control subjects indicated that the percent predicted peak flow rate values were 20% lower among Hutterites than control subjects. The purpose of this study was to determine if the decreased peak flow rate values among male Hutterites were a function of decreased airway patency or decreased respiratory muscle strength. Peak flow rate, muscle and lung function and the prevalence of respiratory symptomatology and disease were evaluated in 27 males from two Hutterite colonies. In one group almost all members consistently used masks while performing farming tasks, while 41% of members from the other colony used masks intermittently. Results suggest that peak flow rate values are decreased predominantly due to decreased airway patency associated with a higher prevalence of respiratory symptoms and disease and are not limited by respiratory muscle strength.

## INTRODUCTION

Pulmonary function tests such as flow-volume loops are used to evaluate the underlying mechanical characteristics of the respiratory system.<sup>1,2</sup> Peak flow rate, a component of the flow-volume loop, has been used as an indicator of airway patency in clinical studies, although respiratory muscle strength may also influence this test.<sup>3-6</sup> Our observations from over 1000 Hutterites and 200 control subjects indicated that the percent predicted peak flow rate values were 20% lower in the male Hutterite population than among male control subjects. Male Hutterites participate in modern large scale farming practices such as confinement housing of livestock and grain operations.<sup>7,8</sup> Thus, they are exposed to intense concentrations of a variety of allergens.<sup>9-11</sup> The use of face masks is variable among Hutterite farmers, but smoking is virtually nonexistent. Moreover, muscular dystrophy has been reported in this population.<sup>12,13</sup>

The purpose of this study was to determine if the decreased peak flow rate among Hutterites was a function of decreased airway patency (increased airways resistance) or was affected by decreased respiratory muscle strength. Peak flow rate, muscle and lung function and the prevalence of respiratory symptomatology

and disease were evaluated in male subjects from two Hutterite colonies. In one group almost all members consistently used masks while performing farming tasks, while 41% members from the other colony only used masks intermittently.

## METHODS

A total of 27 males from two Hutterite colonies in southeastern South Dakota participated in this study which was conducted on site. All subjects signed a consent form approved by the University of South Dakota Human Experimentation Committee. Height and weight of each individual were measured. An Apple "Microloop" computer with a built-in pneumotachograph was used to measure pulmonary function and maximum voluntary ventilation, an indicator of respiratory muscle strength and endurance.<sup>2,6,14</sup> Calibration was performed daily according to the manufacturer's specifications. All tests were conducted on seated subjects who wore a noseclip. Participants were coached to achieve best efforts. The sum of the highest forced vital capacity and forced expiratory volume in one second was recorded. Maximum inspiratory and expiratory pressures were measured according to the technique of Black and Hyatt<sup>15</sup> using two pressure gauges mounted on a 15.2 long 3 cm diameter metal cylinder containing a small



leak. Maximum inspiratory pressures were recorded near residual volume following a full expiration and maximum expiratory pressures were determined near total lung capacity following a full inspiration. All maneuvers were repeated three times with short rest periods in between. The best values were used for analysis. The occurrence of respiratory symptomatology and disease was evaluated using the standardized American Thoracic Society Epidemiological Questionnaire.<sup>16</sup>

Data were entered into an IBM mainframe computer and analyzed using the SAS Version 6.0 parametric and non-parametric tests to compare lung and muscle function tests and the prevalence rates of respiratory symptomatology and diseases between the two groups. Correlation analysis was performed to evaluate the relationship between peak flow rate, respiratory muscle strength and lung function. Only those variables that were significantly correlated with peak flow rate greater than 0.05 were used in a stepwise, forward multiple regression analysis.

## RESULTS

Individuals from both colonies were similar in ages, height and weight (Table I). The prevalence of respiratory symptoms (Table II) displayed distinct differences between individuals from the two colonies. Members of Colony A reported a higher frequency of cough, phlegm production, and wheezing during chest colds than did Colony B members. A similar trend was noted with the prevalence rates of respiratory diseases (Table III) especially chest colds, lung problems at an early age, chronic bronchitis and asthma.

| Table I<br>Anthropometric Characteristics of Hutterites from two Colonies |                   |                   |  |
|---|-------------------|-------------------|--|
|   | (mean±SD)         |                   |  |
|   | Colony A (n = 12) | Colony B (n = 15) |  |
| Age (years)   | 30.7±9.75         | 31.7±11.3         |  |
| Weight (kg)   | 76.4±10.0         | 74.7±10.9         |  |
| Height (m)  | 1.72±0.084        | 1.73±0.83         |  |

| Table II<br>Prevalence Rates of Respiratory Symptomatology |          |        |          |
|--|----------|--------|----------|
|  | Colony A |        | Colony B |
| Cough any time   | 33.3%    | P<0.01 | 0%       |
| Cough in am  | 16.7%    | P<0.05 | 0%       |
| Cough in pm  | 41.7%    | P<0.05 | 6.7%     |
| Phlegm production  | 50%      | P<0.05 | 6.7%     |
| Wheeze during colds  | 50%      | P<0.05 | 13.3%    |
| Wheeze other times   | 8.3%     |        | 0%       |
| Breathlessness   | 25%      |        | 6.7%     |

| Table III<br>Prevalence Rates of Respiratory Diseases |          |        |          |
|---|----------|--------|----------|
|   | Colony A |        | Colony B |
| Chest colds   | 66.7%    | P<0.05 | 26.7%    |
| Lung problems before 16                               | 25%      | P<0.05 | 0%       |
| Pneumonia   | 8.3%     |        | 0%       |
| Hay fever   | 8.35%    |        | 6.7%     |
| Chronic bronchitis                                    | 16.7%    | P<0.05 | 0%       |
| Asthma  | 16.7%    | P<0.05 | 0%       |
| Sinusitis   | 25%      |        | 13.3%    |

| Table IV<br>Peak Flows (PF) and Other Lung Function Tests  |           |        |           |
|--|-----------|--------|-----------|
|  | (mean±SD) |        |           |
|  | Colony A  |        | Colony B  |
| PF (L/sec)   | 7.67±1.57 | P<0.02 | 9.64±2.27 |
| FVC (L)*   | 3.66±0.82 | P<0.01 | 4.58±0.81 |
| FEV <sub>1</sub> (L)**                                     | 3.15±0.87 | P<0.01 | 4.06±0.68 |
| FEV <sub>1</sub> /FVC%                                     | 86.1±12.6 |        | 88.8±4.6  |
| * FVC forced vital capacity                                |           |        |           |
| ** FEV <sub>1</sub> forced expiratory volume in one second |           |        |           |

Pulmonary function test results (Table IV) indicate that Colony A members had lower peak flow rates, forced vital capacities and forced expiratory volumes in one second than did members from Colony B. Although the ratio of forced expiratory volume in one second to forced vital capacity was not significantly different between the two groups, the variability of this test determined by the standard deviation and the coefficient of variation was greater in Colony A members (14.6%) than in colony B members (5.2%)., The maximum voluntary ventilation in individuals from Colony B was significantly greater than those from Colony A, while no differences were noted in the peak pressure data (Table V).

| Table V<br>Peak Inspiratory and Expiratory Pressures (PI & PE) and Maximum Voluntary Ventilation (MVV) |           |        |          |
|--|-----------|--------|----------|
|  | (mean±SD) |        |          |
|  | Colony A  |        | Colony B |
| PI (cm H <sub>2</sub> O)   | 125±41    |        | 127±36   |
| PE (cm H <sub>2</sub> O)   | 151±28    |        | 147±52   |
| MVV (L/min)  | 131±32    | P<0.01 | 157±32   |

Pulmonary and muscle function test results that were significantly correlated (P<0.001) with peak flow rate included maximum voluntary ventilation, forced expiratory volume in one second, the ratio of forced expiratory volume in one second to forced vital capacity

and peak inspiratory pressure. The results of the stepwise, forward multiple linear regression analysis indicated that maximum voluntary ventilation and the ratio of forced expiratory volume in one second to forced vital capacity accounted for most of the differences in peak flow rate between members of each colony.

## DISCUSSION

Significant differences in respiratory symptomatology and disease history, lung function and maximum voluntary ventilation exist in subjects from the two colonies. Although maximum voluntary ventilation may be influenced by muscle strength and/or airways patency, the results of the peak pressure tests, indicated that all participants displayed similar respiratory muscle strength. Thus suggesting that airway patency plays a greater role in predicting peak flow rate values than does respiratory muscle strength in these subjects.

Rochester and Braun<sup>17</sup> reported that peak inspiratory pressure, but not peak expiratory pressure was markedly reduced in patients with chronic obstructive lung disease due both to skeletal muscle mechanical disadvantages associated with elevated lung volumes and generalized respiratory muscle weakness. Although subjects from Colony A did not have severe chronic obstructive lung disease, they did have symptoms indicative of lung dysfunction suggesting that even mild alterations in pulmonary function may affect dynamic respiratory muscle performance.

Multiple regression analysis suggests that maximum voluntary ventilation but not peak inspiratory pressure influenced peak flow rate values. Aldrich and co-workers<sup>18</sup> noted that increased airway resistance can decrease maximum voluntary ventilation. In addition, Takishma and co-workers<sup>5</sup> concluded that both increased airway resistance and uneven distribution of ventilation may affect maximum voluntary ventilation. Two tests of respiratory muscle function were used in the present study, peak inspiratory and expiratory pressures which are static tests and maximum voluntary ventilation which is a dynamic measurement. Therefore, in the face of increased airway resistance and/or uneven distributions of resistances and compliances, results of maximum voluntary ventilation would be predicted to be markedly decreased; thus leading to the discrepancy between static and dynamic tests of respiratory muscle function in our Colony A subjects.

The decreased peak flow rate values may also be associated with the differential use of masks during farming in the members from each colony. Colony A members work primarily with hogs and dairy cattle in confinement operations. High concentrations of respiratory irritants and allergens may be encountered in these operations.<sup>10,11</sup> Colony B members, in contrast, raise turkeys, which are associated with very different combinations of agents.<sup>9,19</sup> More important-

ly, 92% of individuals from Colony B utilized masks while farming, whereas only 41% of members from Colony A used masks. Of interest, many Colony A members only started using masks after they developed respiratory symptoms.<sup>8</sup>

## CONCLUSION

Results indicate that peak flow rate values among Hutterite farmers are decreased primarily due to decreased airway patency and not limited by respiratory muscle strength. Moreover, a dynamic respiratory muscle function test such as maximum voluntary ventilation may be influenced by a number of factors including decreased airways patency and altered lung compliance.

## AUTHORS

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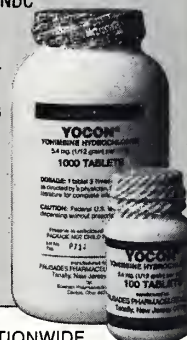
**Dosage and Administration:** Experimental dosage reported in treatment of erectile impotence.<sup>1,3,4</sup> 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to 1/2 tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.<sup>3</sup>

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### To Kill a Messenger

In the old days of the kings and princes, a method of expressing displeasure at bad news was to kill the messenger. Although this may have provided temporary relief from frustration for the potentate and permanent but unsolicited relief for the messenger, the real problem at hand was not addressed.

In our modern society elected officials and CEO's of corporations have decided to react to the bad news about rising health care costs by killing the provider. This approach, of course, has only a few superficial similarities to the ancient customs. One of the similarities, however, is that grappling with the major problems is avoided even though politically it might even be wise to avoid the inevitable sacrifices necessary to resolve our present health care dilemmas.

What are the dangers of the evolving plan which the Clinton administration is advocating as the debate continues?

First, it does not seem reasonable to approach a problem of escalating demand by having the providers limit the supply of services. Unfortunately, the real root causes of rising health costs must be appreciated. One of which is certainly increasing demand for services. There has to be enough disincentive on the supply side to discourage overutilization. The Oregon Plan, higher deductibles and copayments or some form of rationing are inevitable to balance the equation.

Second, the major emphasis in the last presidential campaign was on the economy and jobs. In spite of this there appears to be little appreciation that health care is one of the major industries in the country. In many small and medium communities the most stable employment is found in hospitals and medical clinics. Concern about medical care is certainly a reason why rural communities fight so hard to keep their hospitals open. However, another is that the hospital is often one of the largest employers in town.

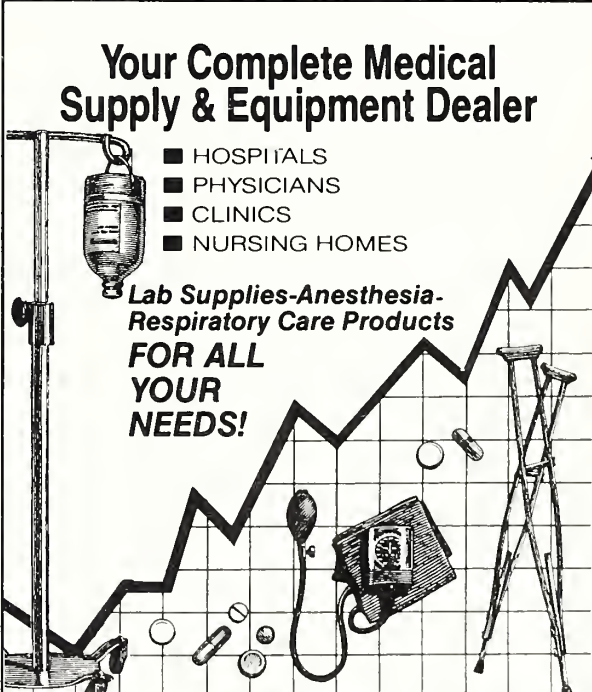
It is often said with alarm that medical care is responsible for approximately 12% of the gross national product. Although we are discussing a service industry, health care provides a nonpolluting, essential service. The demand and interest in medicine continues to rise. If you do not believe this, watch any television news broadcast. A portion will be devoted to news from Medicine. It is difficult to get the *New England Journal of Medicine* or the *Journal of the American Medical Association* read before one or more articles are summarized on the tube.

It is necessary to point out that if there are severe restraints placed on the growth and maintenance of medical facilities, many people are going to lose their jobs. It is doubtful that the layoffs will be predominantly physicians or administrators even though their

incomes will decrease. As in most industries, others suffer; people in middle management, secretaries, and nurses will be the ones to lose their jobs.

Lastly, there has been minimal attention paid to the tremendous impact of medical liability on health care costs. Reduction in the amounts of awards and basis for bringing lawsuits must be considered since this area is a major reason why health care in the United States is so high. The American Medical Association has been accused of being a pressure group but the trial lawyers have even greater influence and their fellow lawyers make the laws. I will paraphrase Mr Clemenceau by saying "Health care is too important to be left to the lawyers".

John F. Barlow, MD  
Editor



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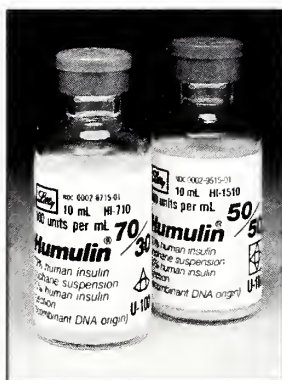




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Ruth Parry, President, South Dakota State Medical Association Auxiliary

### A New Beginning

With the arrival of spring, we look forward to the first flowering plants, the leafing of the trees and the greening of the grass. This new beginning gives each of us a fresh opportunity for success with our gardening endeavors. Our commitment to weeding and watering is usually the determining factor in achieving the desired result.

As this final column is put together, it symbolizes an end to a special portion of my life. The opportunity to nurture relationships and cooperate to shape an organization is one which does not often present itself. I have appreciated the many special people I have come to know this year. You have made the memory.

However, the reality of this cycle is that we are now at a new beginning. As an organization we will be voting on a name change at the annual meeting in June. South Dakota State Medical Association Alliance, Physician Spouses dedicated to the health of America, signifies not a new organization but rather a new attitude. This is a new beginning toward a more diverse membership.

The reports of the Hillary Rodham Clinton Health Care Proposals also signify a new beginning. Changes are never easy, but this may provide an opportunity for

health care professionals to assist in making health care more accessible and more affordable. Patient care is always of utmost importance to physicians, and that will continue to be the focus of the profession.

Each of the South Dakota districts are making plans for the next year by electing new officers and forming new committees. This new beginning will give new opportunities for weeding and watering. District VI continues to flourish as our most recently re-activated auxiliary. The enthusiasm and excitement of the new officers in combination with the experience of the long-time members will always serve our organization well. We are fortunate that all continue to be available.

Patti Herlihy, as the president of SDSMAA, will also provide us with a new beginning. Her organizational skills and knowledge of our auxiliary will keep us focused on her goals; her warmth and charm will provide the motivation for achieving them. Patti and her Board of Directors will nurture our organization, and we will flourish. The cycle continues.

*Ruth Parry*

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## Biotechnology: A Theoretical Reality

Michael G. Duncan, Pharm.D, R.Ph., Sioux Falls, SD

**B**iotecnology—a term that generates fear in some, amazement in others, confusion and curiosity in several, and excitement and hope in many. What does "biotechnology" mean? Broad definitions have been suggested, but they could include foods, pharmaceuticals, and diagnostics. A more medically-oriented definition of clinical biotechnology would be:

"The development and use of novel cells, organisms, and bioprocessing techniques to make or modify products that can be used for an understanding of the basic factors responsible for both wellness and for the pathologic state and that may be used for diagnosis, prognosis, or therapy."<sup>1</sup>

Biotechnologic processes have been applied to foods for thousands of years. However, it has only been over the past 30-35 years that biotechnology has been applied to pharmaceuticals. One of the first examples of this was the large-scale production of penicillin in the 1940's.

Refinements in recombinant DNA (rDNA) technology and the development of new technologic processes (monoclonal antibodies) has led to an explosion of biotechnologic pharmaceuticals and diagnostics over the past 11 years. Starting with the introduction of rDNA-produced human insulin in 1982, 14 biotechnologic products are currently approved for use and over 400 additional products are in various stages of development.<sup>2,3</sup>

The process behind recombinant DNA technology can be broken into several steps. The first step is identification and isolation of the gene. This can be accomplished via several mechanisms including beginning with an enriched pool of the desired substance or factor and isolating its messenger RNA (mRNA). Once the desired mRNA is isolated, utilization of reverse transcriptase results in the production of complementary DNA which codes for the substance. The DNA is inserted into a plasmid (DNA recombination) and the plasmid is then inserted into a host cell (bacteria, yeast, or tissue culture). The next step is integration of the plasmid into the host system with resultant DNA replication and cell division (cloning) and protein production (expression). The final step is large-scale fermentation, protein isolation and purification, and packaging of the product for clinical use.

Current and future products of recombinant DNA technology include vaccines, colony-stimulating factors, erythropoietin, interferons, interleukins, gene therapy, antisense oligonucleotides, DNA probes, diagnostics, growth factors, blood factors, etc. The

possible applications of this form of technology are virtually limitless.

Polyclonal antibodies have been in existence for many years; it is only over the past 20 years that monoclonal antibodies (MoAb) have been available. In 1974, Kohler and Milstein devised a method to obtain unlimited supplies of a singly-specific antibody (monoclonal antibody).<sup>4</sup> In 1975, the first MoAb was produced from mice that had been immunized against sheep red blood cells. This pioneering work led Kohler and Milstein to the Nobel Prize in Medicine in 1984.

MoAbs are immunoglobulins that are produced by a cloned population of B-lymphocytes stimulated by T-lymphocytes in response to an antigen challenge. B-lymphocytes, being mortal, die after several days in culture. It is therefore necessary to create an immortal B-lymphocyte cell line in order to produce MoAbs in adequate quantity. The production of MoAbs consists of several steps. The first step in the production of a murine MoAb is to immunize a host (mouse) with the desired antigen. After two to three weeks, the host's spleen cells (rich in B-lymphocytes) are removed and fused with an immortal murine myeloma cell line. This fusion produces a "hybridoma" that is immortal, and secretes the desired antibody. The hybridoma cells are then isolated and assayed for specific antibody secretion. The next step involves "cloning" the desired hybridoma in either mass tissue culture or in mouse ascites. The final step involves isolation and purification of the MoAb and packaging for use. Several variations on the above process are available to produce different types of MoAbs including chimeric (combination mouse-human) and human.

Examples and applications for MoAbs include diagnostic tests (hormone, drug, and tumor marker assays), antidotes for drug overdose, anti-rejection drugs, immunotoxins, removal of "toxins" from the blood (i.e. endotoxin, exotoxin, tumor necrosis factor, interleukin-1), and many, many others. There are more than 50 MoAbs currently under investigation for a variety of the therapeutic and diagnostic applications.<sup>5</sup>

In conclusion, while biotechnologic processes have provided both physicians and pharmacists with both improved pharmaceutical products and novel therapeutic and diagnostic agents, several issues and questions must be addressed, among them are:

1. Ethics of genetic manipulation. Who should receive these potentially very expensive agents? Who and when should genetic testing be performed to identify persons predisposed to genetic diseases? Society must act diligently to resolve these ethical concerns.

2. Financial considerations. It has been estimated that sales of biopharmaceuticals will exceed \$60 billion by the end of the decade. This represents a 5,000% increase in current sales. Outcomes research will be crucial to ensure cost-effective use of these agents.
3. Further knowledge of the human response to these agents. Additional research is necessary in order to determine exactly how these agents work, what they do, and when they should be administered.

These and other questions will continue to be heard as the medical field learns more about the science and physiology behind biotechnology.

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Edited by Brian Kaatz, Pharm.D.



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# Molecular Medicine: A Primer for Clinicians

## Part II: Recombinant DNA Molecules

*Department of Biochemistry and Molecular Biology. Edited by Ronald Lindahl, Ph.D*

### ABSTRACT

This is the second paper in our continuing series on the impact of molecular medicine on clinical practice. Discussed are some of the basic methods used to produce recombinant DNA molecules and how these molecules are characterized. Special emphasis is placed on the use of these methods to isolate and characterize human genes.

### INTRODUCTION

This is the second paper in our series designed to familiarize the practicing clinician with molecular medicine. The premise underlying these presentations is to introduce the concepts of molecular biology to physicians and to demonstrate how their application to practical problems is revolutionizing the day-to-day practice of medicine. In the first paper in this series, we reviewed some of the basic concepts of biological information flow in human cells, including gene structure, transcription and translation.<sup>1</sup> In this paper and the next, we will explain some of the basic methods used in molecular medicine. With this background, future papers will provide perspectives on some of recent and potential future applications of the tools of molecular biology to medical problems. Several excellent reviews of and how-to guides for recombinant DNA methods are available.<sup>2-4</sup>

As you will see, essentially all the techniques of molecular medicine are based on two properties of nucleic acids. These are the specificity of complementary base-pairing (adenine pairing with thymine [or uracil in RNA] and guanine pairing with cytosine) and the uniqueness of nucleotide sequences. The specificity of complementary base-pairing provides the means for creating novel combinations of nucleotide sequences, recombinant DNA molecules. Sequence specificity is the basis by which many enzymes, particularly the restriction endonucleases, cleave DNA molecules.

### RESTRICTION ENZYMES

Restriction endonucleases, more commonly called restriction enzymes, are a class of DNA-modifying en-

zymes that occur naturally in all bacterial species. Restriction enzymes function in nature to destroy foreign DNA that bacteria may encounter during their life cycle, either through interactions with other bacteria or with bacterial viruses. Restriction enzymes recognize particular short DNA sequences, usually 4 to 6 nucleotides in a row within much longer sequences, and cleave the sugar-phosphate backbone of both strands of the double helix within the recognition sequence (Figure 1). If the recognition sequence is masked by modifying one or more of its bases, the restriction enzyme cannot recognize the sequence and will not cleave the DNA. Therefore, each bacterial species or strain has a particular restriction endonuclease that recognizes a particular sequence and an additional enzyme that modifies the appropriate sequences in its own DNA, but not the foreign DNA, to prevent the restriction enzyme from destroying the host genetic material.

More than 200 restriction enzymes have been identified in different bacteria (Table I). At least 150 of these can be purified or produced in such amounts to make them commercially available as tools for the *in vitro* manipulation of DNA. The enzymes are usually named for the genus and species of bacteria from which the enzyme has been isolated. For example, the enzyme EcoRI, was the first restriction endonuclease isolated from *Escherichia coli* strain RY13. Likewise, HindIII was the third enzyme isolated from *Haemophilus influenzae* strain Rd.

As noted above, restriction enzymes recognize and cleave DNA at specific sequences. The cleavages can occur in one of two ways (Figure 1). The sugar-phosphate backbone can be broken between the same two

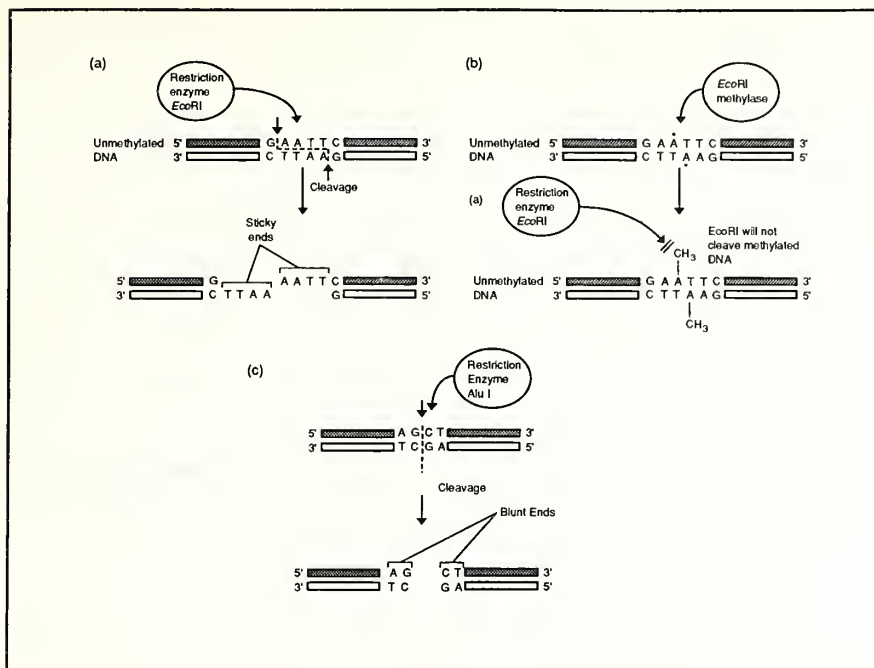


Figure 1

Digestion of DNA with restriction enzymes. Digestion with EcoRI produces single-stranded, sticky ends (a). Digestion with AluI produces double-stranded, blunt ends (c). Restriction enzymes can be prevented from digesting DNA if the recognition site is "hidden", for example by methylation of a base (b). Adopted from *Molecular Cell Biology* by Darnell et al. with permission.

Table I  
Some Restriction Endonucleases

| Source Organism                | Enzyme* | Recognition Site       |
|--------------------------------|---------|------------------------|
| <i>Arthrobacter luteus</i>     | AluI    | AG <sup>↓</sup> CT     |
| <i>Thermus aquaticus</i>       | TaqI    | T <sup>↓</sup> CGA     |
| <i>Escherichia coli</i>        | EcoRI   | G <sup>↓</sup> AATTC   |
| <i>Haemophilus influenzae</i>  | HindIII | A <sup>↓</sup> AGCTT   |
| <i>Nocardia otitiscaviarum</i> | NotI    | GC <sup>↓</sup> GGCCGC |

\* Names of enzymes are derived from the bacteria from which they are isolated. Arrow represents where in the recognition sequence the enzyme cleaves the DNA sugar-phosphate backbone.

base pairs on both strands of the DNA molecule to produce two ends without single stranded regions. These are called "blunt" ends (AluI in Figure 1). Alternatively, the backbone cuts can occur between different base pairs on the two strands leaving a double helix held together by only the hydrogen bonds holding the intervening base pairs together. These weak bonds are easily broken, producing free ends with complementary single stranded extensions. These are called "sticky" ends (EcoRI in Figure 1). For many DNA manipulations, the presence of single stranded, sticky ends is an advantage.

As will be seen below, restriction enzymes find a wide variety of uses in molecular medicine. They are critical

in producing recombinant DNA molecules because they provide the free ends by which two different DNA molecules can be rejoined. The presence of complementary sticky ends provides some degree of specificity in the recombination process. Restriction enzymes also provide a means of producing smaller, more manageable pieces from very large pieces such as chromosomes. The essentially random distribution of "restriction sites" for a particular enzyme in a particular DNA provides a unique "map" or "fingerprint" that can be used to identify a sequence of interest in a very large population of DNA molecules.

## CONSTRUCTION OF RECOMBINANT DNA MOLECULES

The production of a recombinant DNA molecule results in a novel combination of DNA sequences that would not normally be found in nature. Most com-

monly, the recombinant molecule is a combination of DNA sequences from a source of interest, i.e. the human genome, with a DNA sequence of bacterial (plasmid or bacteriophage) origin (Figures 2 & 3). The resultant molecule consists of the fragment from the source of interest, the insert, specifically recombined via restriction enzyme sites with the plasmid or bacteriophage sequence.

The plasmid or bacteriophage is called the vector or backbone. They provide the vehicle by which the insert DNA can be propagated and manipulated. A plasmid is a small, non-chromosomal DNA molecule that often resides in bacteria. Plasmids can reproduce themselves independently of the bacterial DNA. They often confer antibiotic resistance on their host cells. Bacteriophages are bacterial viruses. They are also capable in independent replication and also often confer unique properties on their hosts. It is the unique properties conferred by the plasmid or bacteriophage that is helpful in selecting recombinant DNA molecules.

The sequence of interest can be derived from one of two sources (Figure 3). The sequence may reside in a fragment of DNA derived from digestion of genomic DNA (chromatin) of the organism with a restriction enzyme. These fragments are called genomic fragments. Alternatively, the DNA sequence of interest can be obtained from its corresponding messenger RNA. In this case, the mRNA population of a cell or tissue is isolated and DNA copies of the mRNAs



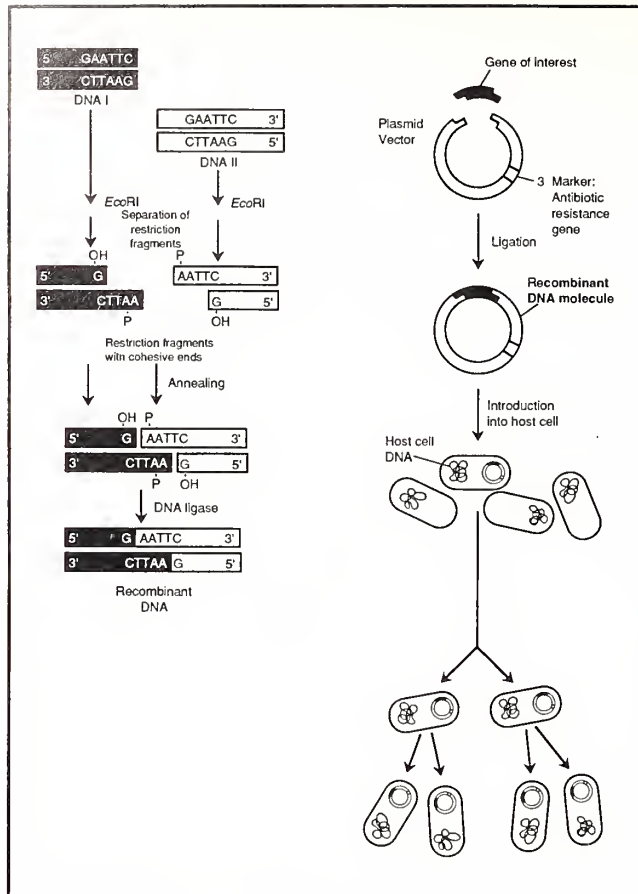


Figure 2

(Left) Production of a recombinant DNA molecule. In this example DNA I and DNA II are separately digested with EcoRI. The two DNAs are then mixed together and a certain proportion of the resultant molecules are recombinants between DNA I and DNA II. DNA I may be the DNA of interest and DNA II may represent the vector sequence. (Right) The cloning of recombinant DNA molecules. The recombinant DNA molecule formed (left) can be amplified or cloned by growth in an appropriate bacterial host cell. Adapted from *Biochemistry* by Mathews and van Holde with permission.

produced by the enzyme reverse transcriptase. The result is a collection of double-stranded, "complementary" DNA copies of the mRNAs, the cDNAs. Therefore a cDNA library can be viewed as a subset of a genomic library. A cDNA library represents all the genes actively transcribed by a given cell. The resulting genomic DNA fragments or cDNAs are modified as necessary (ie., provide the cDNAs with sticky ends) so that they will recombine efficiently with the vector DNA molecules.

Most commonly, the genomic fragments or cDNAs are produced from the total genomic DNA or total mRNA population of interest so that the specific DNA sequence(s) of interest reside as recombinant DNA molecules within a very large population. These much larger populations are referred to as libraries, either a genomic library or cDNA library. The libraries are amplified by allowing the recombinant molecules to replicate for several generations in their bacterial host (Figure 2b). The amplification process results in a library with many copies, or clones, of all the genomic or cDNA fragments.

## IDENTIFICATION OF RECOMBINANT DNA MOLECULES

Once the appropriate library has been established or obtained, identification and analysis of the particular genomic or cDNA clone of interest follows. This requires that the specific clone be isolated from all others. This process is often referred to library screening or the "cloning" process. The resulting genomic or cDNA clone is then the source material for further manipulation.

One of two approaches is generally taken in identifying and isolating a recombinant DNA molecule (Figure 4). The approach taken depends on several factors,

including how the library was constructed and what will be the ultimate use of the molecule of interest. Both approaches rely on having a means of identifying the specific clone of interest within the larger population.

One approach is to have some previous knowledge about the protein product encoded by the DNA of interest. This may include possessing antibodies specific for the protein product. In this case, the recombinant molecule of interest must not only be replicated in its bacterial host, but the DNA must be transcribed into its mRNA and the

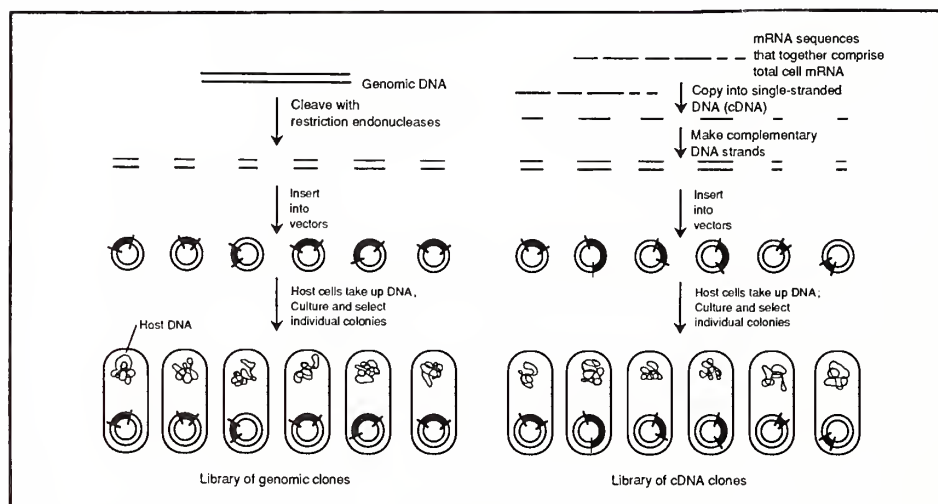
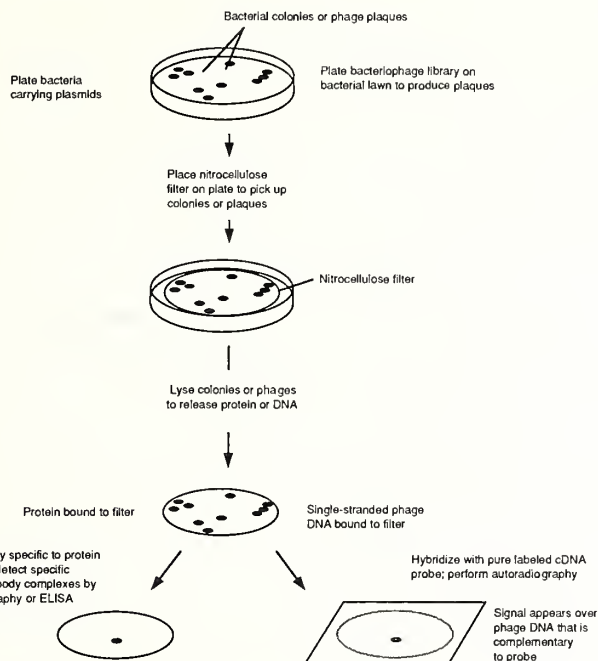


Figure 3

Cloning of genomic DNA or cDNA. Genomic DNA (left) is digested with a restriction enzyme to produce smaller fragments prior to insertion into vectors. cDNA cloning (right) begins with mRNAs, from which the double-stranded complementary DNA must be copied prior to insertion into vectors. Adapted from *Molecular Cell Biology* by Darnell et al. with permission.

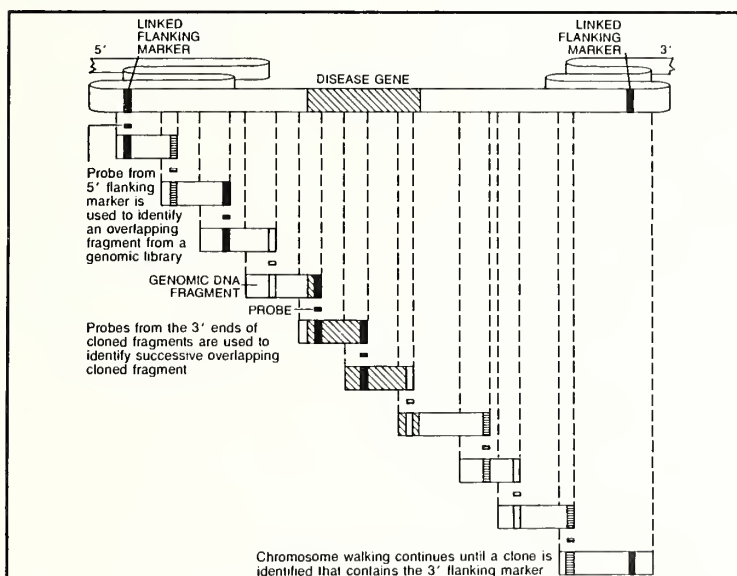
### Plasmid Expression Library

### Bacteriophage Library



**Figure 4**

**Identification of recombinant DNA molecules. (Left) Identification of recombinant molecules by detection of their protein products following expression in bacteria. (Right) Identification of recombinant DNAs directly by hybridization to a specific DNA probe. Adapted from *Molecular Cell Biology* (2nd Ed.) by Darnell et al. with permission.**



**Figure 5**

**Detection of a disease gene by chromosome walking and jumping. The methods are the same as those used for direct detection of recombinant DNA molecules (Figure 4, right). However, in this approach the starting source of DNA is a population of very large (>20-100Kb) genomic pieces of DNA inserted into vectors. Adapted from *DNA Science* by Micklos and Freyer with permission.**

mRNA must be translated by the bacterial protein synthesizing machinery to produce a protein product that can be recognized by the specific antibodies in an appropriate assay. This approach requires that the starting library be a cDNA rather than genomic library, because bacterial cells cannot process (i.e. splice out introns or add the polyA tail) the primary products of eukaryotic gene transcription into functional mRNAs. A cDNA library from which protein products can be produced is called an expression library (Figure 4, left).

For the expression library approach to be successful, the resulting product must be sufficiently different antigenically from any bacterial gene products for the antibodies to specifically recognize the recombinant product to the exclusion of all others. For some human gene products, such as insulin or human growth hormone, this has proven to be the case. However, for many other gene products, there are bacterial homologs that may be sufficiently similar to produce false-positive results. Therefore, screening expression libraries may not always be successful.

The second approach for library screening also requires some knowledge about the gene product of interest. However, it does not rely on the production of the product by bacteria for its success. If sufficient purified protein can be obtained and some amino acid sequence determined, the resulting sequence can be used to develop specific DNA "probes". This approach uses the genetic code to prepare a short piece of radioactive DNA sequence, called an oligonucleotide, based on the known amino acid sequence. Even allowing for the redundancy of the genetic code, oligonucleotide sequences 20 to 50 bases long can be prepared which are quite specific and will only recognize their exact complement under the proper conditions. Since the radiolabelled oligonucleotide sequence is specific for the gene product of interest it can be used to "probe" the library and identify only those clones that contain that particular insert sequence (Figure 4, right). Even if the amino acid sequence of the exact gene product of interest is not known, the appropriate amino acid or DNA sequence from a related organism or related gene can often be used to produce an appropriately specific oligonucleotide probe. This approach can be used to isolate clones from either genomic or cDNA libraries.

Another approach to identifying appropriate clones relies on the previous isolation of other clones. For example, a cDNA clone



may already have been isolated, but subsequent analysis indicates that it is not full-length, i.e. it contains part, but not all, of the protein-coding sequences present in the mRNA. This partial cDNA clone can be used as the probe to rescreen the cDNA library to either identify full-length clones or other partial clones with which to construct a full-length molecule (Figure 4, right). Alternatively, a cDNA clone can be used to isolate appropriate genomic clones to examine the structure of the gene of interest. Or a previously isolated genomic clone can be used to identify cDNA clones in a cDNA library.

Most recently, genomic libraries containing very large genomic fragments have been screened to isolate human genes associated with genetic diseases when nothing has been known about the nature of the gene product. This approach is called positional cloning or "reverse genetics". It relies only on knowing the approximate chromosomal location of the gene of interest and having probes for closely linked marker genes (Figure 5). Here the approach is to use probes to the closely linked markers to literally "jump" or "walk" along the very large genomic fragments by DNA sequencing, searching for potential protein coding regions. This is the basic approach that led to the identification of the cystic fibrosis and Duchenne's muscular dystrophy genes.<sup>5,6</sup>

## SEQUENCING OF DNA

Once a cDNA or genomic fragment has been isolated its characterization is undertaken. An initial step is to produce a map of the restriction enzyme sites by determining which of a battery of restriction endonucleases cut the insert portion of the recombinant molecule. Since most vectors are widely available, their nucleotide sequences and restriction maps are known and serve as useful reference points. A restriction map not only helps to partially characterize the particular DNA sequence, it can provide a catalog of convenient sites which may be useful in further manipulating the DNA.

Determining the nucleotide sequence of the insert is also an early characterization step. Two methods for direct sequencing of DNA exist. One method is referred to a Maxam-Gilbert sequencing. It relies on cleavage of DNA molecules at specific bases by specific chemicals. The second approach is often called the Sanger dideoxy method (Figure 6). The Sanger method relies on the enzymatic incorporation of dideoxy

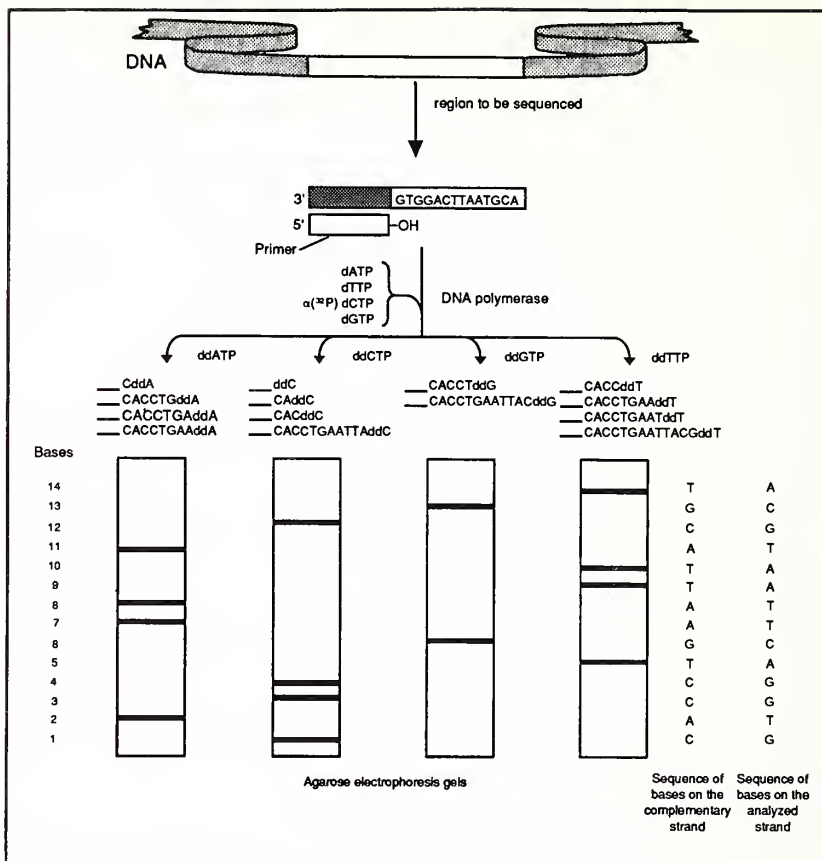


Figure 6

DNA sequencing by the dideoxynucleotide method. Modified from Biochemistry by Mathews and Van Holde

nucleotides into replicating DNA molecules. Since the dideoxy analogs lack the group necessary for subsequent nucleotide addition (the 3'-hydroxyl group of the deoxyribose sugar), DNA replication stops. The incorporation of a dideoxy nucleotide in place of its deoxy form is essentially random. Therefore, a population of partially replicated DNA molecules of different lengths is produced which can be separated by electrophoresis. While the choice of sequencing method is often one of personal preference, the Sanger method is favored by many investigators for its simplicity. Another aspect of the simplicity of DNA sequencing is that the DNA sequence resulting from either type of sequencing procedure can literally be "read" directly off an appropriate autoradiograph (Figure 6). An average sequencing gel can produce the sequence of 200 to 300 consecutive bases in a DNA molecule. Therefore sequencing of several hundred to thousand base pairs in a matter of a few days or weeks is routine.

Direct sequencing is a valuable source of information about a DNA molecule of interest. First, sequencing can confirm that the isolated DNA is indeed the one of interest, if some reference DNA or amino acid sequence is known. Since the genetic code is universal, sequencing can also identify potential

protein coding regions in unknown cDNA (opening reading frames) or genomic (exons) clones. Not only protein-coding, but other important structural features of cDNAs and genes can be also identified by direct sequencing. These include the organization of exons and intervening sequences and identification of promoters and other sequences important in their regulation. For both DNA sequencing and sequence analysis, computer programs and large data-bases are routinely used to search for homology to existing sequences. These searches can establish identity and aid in elucidating potential functions of genes identified by reverse genetics.

One important clinical application of DNA sequencing already in use is the detection of mutant form (alleles) of a gene for diagnosis or screening. For example, the presence of mutant alleles of the cystic fibrosis gene may be detected by other methods, but the confirmation of a particular mutation in a carrier or patient must be determined by direct sequencing of the CF DNA.<sup>7</sup>

The isolation of a specific complementary or genomic DNA is usually the limiting step in the molecular analysis of a human gene. For example, it took several years and the collaborative efforts of three large research groups to isolate the human cystic fibrosis gene. However, once identified, the characterization of the gene led, within a matter of months, to potential new treatments and screening tests for CF. These new treatments and tests are based on the function and structure of the CF gene product and represent one of the first practical clinical applications of molecular medicine.<sup>8</sup>

In the next paper in this series we will explain some of additional basic methods used to characterize

human genes. These include Southern and Northern analysis, restriction fragment length polymorphisms and the polymerase chain reaction. Then we will examine how all these methods can be focused on other practical problems in molecular medicine.

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Table II  
Key Terms Used in Molecular Biology

|                          |  |
|--------------------------|--|
| Genomic DNA              | All the DNA sequences of an organism.  |
| cDNA (complementary DNA) | A DNA sequence produced from a mRNA.   |
| Library                  | A collection of all the genomic DNA of an organism or all the cDNAs of a particular cell.  |
| Recombinant DNA molecule | A DNA composed of DNA sequences from two different sources.  |
| Plasmid                  | A small circular bacterial DNA capable of independent replication in its host.   |
| Vector                   | The plasmid or viral DNA into which a genomic or cDNA is inserted.   |
| Restriction enzyme       | An enzyme that cleaves DNA at specific sites based on recognition of unique sequences.   |
| Oligonucleotide          | A short sequence of DNA (20-50 base pairs) that is useful in a variety of recombinant DNA techniques.  |
| Probe                    | A known DNA sequence obtained from a genomic DNA, a cDNA or an oligonucleotide used to specifically detect a complementary DNA sequence in a large DNA population. |
| DNA sequencing           | Determination of the exact nucleotide sequence of a DNA molecule.  |



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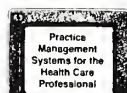
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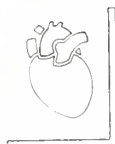
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## Extenuating Circumstances

A periodic column of personal, ethical, and socioeconomic reflections on medicine.

I put on my green name tag for the first time, signifying my status as a fourth year medical student, and feel a certain twinge of self-satisfaction. Magically, in a single day, my knowledge and skills have seemingly increased. Entering the hospital today, I feel a renewed vigor.

"There's an interesting consult on 2000," says my attending physician. "He's 19 years old. Why don't you go see him and give me a call when you're done."

Off I go with my green tag as my new armor. "Let's see," I say to myself, "a tumor, maybe seizures. Could be muscular dystrophy, or maybe even trauma—what else would they see a neurologist for?" Looking forward to the challenge, I choose to not look through the old records, but to visit the patient first.

I enter the room in midst of a discussion between the patient's mother and 12 year old brother. As I introduce myself, the young man in bed does not stir. Before I have a chance to ask, mother launches into a full history. "About one and a half years ago, he was in a wreck. Nobody was drinking, but the car went into the ditch." I try to engage the patient, and realize there is no response. "He doesn't talk," mom whispers over my shoulder, "but he'll respond to you." Little brother adds, "Yeah, when I pinch him, he always tries to shoo me away!" A feeling of darkness creeps over me. I ask the mother if her son has changed lately—has he done anything new? "He seems to respond more each week," she says, unable to think of examples, but none the less sure of his "progress".

After performing as complete of a neurological exam as I am able, my discouragement grows. Decerebrate. Decorticate. I leave the room, saying that I will talk with the doctor and be back in a few minutes. I peruse the old chart and my despair is complete. Unless I have missed something, the exam is unchanged from the time of injury. This young man is in a vegetative state.

My despair is less for the patient than for his mother and brother. Had someone not told them? Were they unable to accept the truth? Further, what kind of care should we offer if this young man really has pneumonia?

I call my attending. He agreed saying, "This situation is very troubling." Multiple caregivers had previously shared the patient's poor progress with the family, but they seem to not have heard or understood. He says, "I'll meet you there and then we'll do rounds." While waiting, I think to myself, "Thank goodness these situations don't happen every day!"

We go back into the room for a quick hello and exam. No change. Tomorrow we will try to talk to the mother again.

Rounds—now we are off to really solve some problems! First is a 30 year old MS patient with whom we discussed the risks and benefits of steroid therapy.

"Does it work? What will it do to me?" she asks. Next we see a 79 year old woman with a severe new stroke, hemiparesis, and speech difficulty. What does her husband want her code status to be? We walk quietly together to the pediatric ICU. There is an 11 year old who is brain dead following a motor vehicle accident. When can the machines be turned off? Back now to a 70 year old who has developed a cerebral hemorrhage from thrombolytic and anticoagulation therapy. Was she well informed of the risks? Was the family aware? Rounds leave me with few solutions.

After a quick sandwich, we head to the clinic. Surely this will be simpler! I see a 16 year old with seizures. On his face I see his painful anxiety as I ponder his release to drive. The next room holds a 52 year old farmer who has had a ruptured cerebral aneurysm. I sense he is desperate to know his absolute prognosis and disability. On now to a 67 year old alcoholic with seizures, who insists on driving a car. In the midst of my anger, I realize that his driving is mostly for care of his shut-in wife. Then there is a woman with a long history of carpal tunnel syndrome. She has had surgery and has normal EMG's. I am confused by her continuing pain, and wonder if she is seeking secondary gain or if this is a psychological problem.

"Help!", I think to myself. The significance of my green name tag is clearer. Instead of the green meaning "go", my green surely represents the green behind my ears. I wonder to myself if it is all right not to always know what to do.

"Let's go sit down in the office," my attending says as he pulls me out of my thoughts. Discussion revolves around the cases of the day. Seeming to know each case deeply, my attending thoughtfully ponders my questions. I am amazed at the progress made in the small steps taken, and some of my frustration lifts. I am realizing that each case requires my judgment and involves my values. "How can we solve all these problems?", I ask. He says, "I'm not sure we can solve each one, but we must think about each one carefully".

Thinking, values, judgments. Suddenly, I realize that this day has been full of ethics; but certainly not the cold, didactic ethics which fill the classroom. This has been a day of anger, despair, frustration, unknowing, and progress. My thoughts turn back to green again, the green of spring. A new season in my education is beginning. I realize that ethics, values, and judgments are part of all I will do.

As I walk into the parking lot, I am thankful for the stories I have heard and guidance I have received.

Mark W. Meyer, MD  
Graduated USDSM on May 15, 1993



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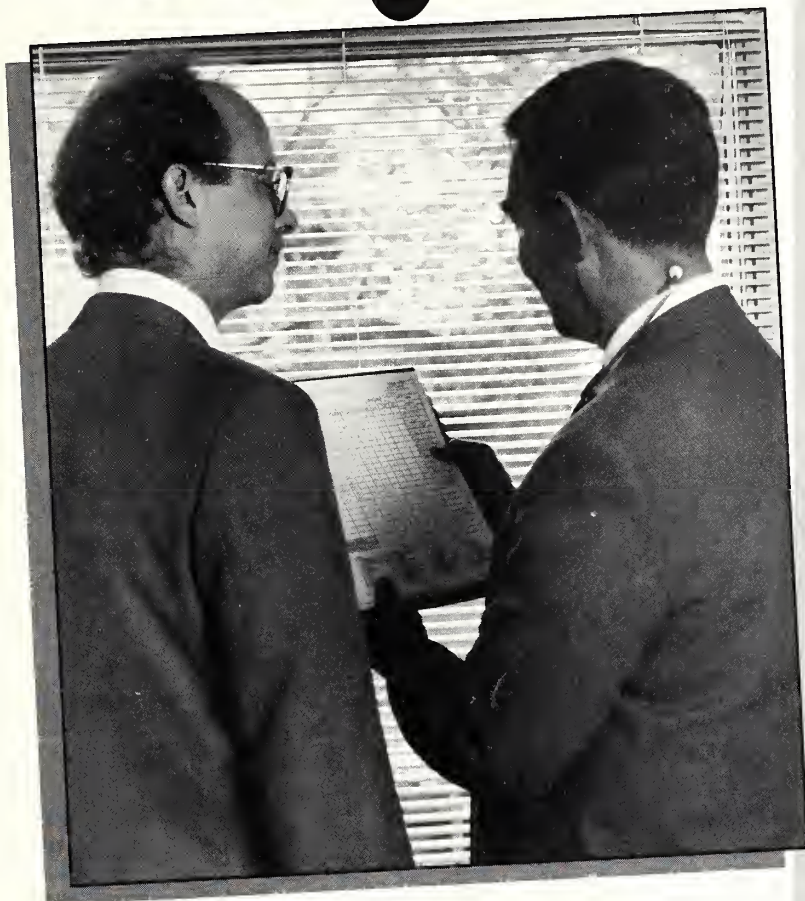
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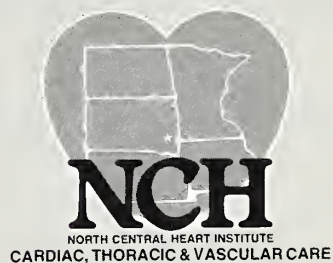
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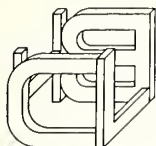
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### How Well Do You Manage Your Malpractice Risks? - Part II

(This is the second of a two-part series of articles on risk management submitted by the Risk Management Committee of Midwest Medical Insurance Company (MMIC). MMIC is a physician-owned professional liability carrier providing coverage for physicians in South Dakota, North Dakota, and Minnesota. Part I of this survey focused on patient relations, communication, and informed consent.)

"Illegible or incomplete documentation is frequently one of our most serious obstacles when defending a physician involved in a medical malpractice claim. While the defense problems associated with poor documentation are significant, one of the most difficult claims to defend is one where the error in documentation actually contributed to the patient injury."

Kathy Hoskins  
Malpractice Defense Attorney  
Hoy & Hoy, Sioux Falls, SD

**N**on-clinical components of medical practice contribute significantly to patient injuries and malpractice claims. This self-survey is intended to highlight areas of risk commonly seen in physician practices. Part II of the survey focuses on areas of great concern in malpractice claims — follow-up systems within the clinic, documentation, and handling of medical records.

While this survey does not address every aspect of the topics raised, physicians should use the survey to stimulate reassessment of his or her documentation practices and medical records handling policies. In addition, clinic follow-up systems should be reevaluated to ensure that errors are not made in the routine handling and follow-up of clinical information.

The questions are all written to elicit a "yes" answer if appropriate risk management mechanisms are in place. Any "no" response should trigger closer analysis of the issue and, probably, remedial action to improve risk management protections.

#### I. MEDICAL RECORD MAINTENANCE AND HANDLING

The medical record is a critical vehicle of communication, both in treating patients and defending malpractice claims. Proper maintenance and handling of medical records is essential to ensure that important clinical information is not lost or overlooked. Appropriate systems for the release of records are necessary to protect physicians against charges of breach of confidentiality.

Evaluate your practice on these issues of medical record maintenance and handling: Yes No

1. I maintain my medical records in an organized fashion so that pertinent information can be easily retrieved.
2. I avoid removing medical records from the clinic for nonessential purposes (ie, I complete my documentation in a timely fashion in the clinic).
3. I review all requests for release of patients' medical records that indicate there might be cause for patient dissatisfaction or a potential malpractice claim.

#### II. MEDICAL RECORD DOCUMENTATION

The quality of medical records is a critical factor in efforts to prevent and control patient injuries and malpractice losses. Many injuries occur because of errors, omissions, illegible entries and other medical record problems that preclude physicians and other health care providers from rendering appropriate treatment. In addition, the record is the primary source of evidence used by the jury in deciding whether a physician or clinic is liable for malpractice. Incomplete records can be devastating to the defense of the claim; as far as the jury is concerned, "If it's not in the record, it probably didn't happen." Careless or inaccurate documentation can also create the impression that the medical care rendered was less than professional.

Evaluate your practice on these issues of medical record documentation: Yes No

1. I follow a consistent format (e.g., SOAP, problem-oriented charting) in my medical records so that pertinent patient information can be easily located by me and anyone else caring for my patients.
2. I maintain complete documentation of my care of patients.
3. I make certain that patient allergies (or lack of known allergies) are conspicuously noted on the medical record.
4. I maintain an up-to-date, centralized medication record that provides an overview of all medications the patient has been taking (including refills).
5. I document all symptom and treatment-related telephone calls made



- |  |     |     |
|--|-----|-----|
| to and received from patients while I am in the clinic.  | ___ | ___ |
| 6. I document all symptom and treatment-related telephone calls made to and received from patients while I am out of the clinic. | ___ | ___ |
| 7. I document all instances of patient noncompliance with treatment advice.  | ___ | ___ |
| 8. My medical records are legible to everyone involved in treating the patient.  | ___ | ___ |
| 9. I avoid subjective, disparaging comments about patients and other health care providers in the medical record.                | ___ | ___ |

The following questions apply if you perform obstetrical services (prenatal and/or delivery): Yes No

- |  |     |     |
|--|-----|-----|
| 10. My prenatal records include documentation of:  |     |     |
| a. Comprehensive health history.   | ___ | ___ |
| b. Pertinent family and social history.  | ___ | ___ |
| c. Comprehensive physical examination.   | ___ | ___ |
| d. Results of necessary or indicated laboratory tests.   | ___ | ___ |
| e. Identification of risk factors and a plan for ongoing management of identified risk factors.  | ___ | ___ |
| f. Gestational age determination and a plan for ongoing management of identified gestational age problems.   | ___ | ___ |
| g. Expected date of delivery (EDC), updated as appropriate.  | ___ | ___ |
| h. Appropriate consultation or referral when indicated.  | ___ | ___ |
| i. Any patient refusal of recommended tests, consultation or referral and discussion with the patient of the risks of refusal and alternatives to recommended actions. | ___ | ___ |

### III. FOLLOW-UP SYSTEMS

The underlying cause of many patient injuries and malpractice claims is the failure of physicians to implement or consistently comply with systems to follow-up on important clinical information. Physicians face almost certain liability if patient data that are, or should be, known to them are overlooked or "fall through the cracks" and an injury or failure to diagnose occurs as a result.

Evaluate your practice on these follow-up systems:

- |   | <u>Yes</u> | <u>No</u> |
|---|------------|-----------|
| 1. I have a system for following up on consultations and diagnostic tests I order if results are not received in a timely fashion.  | ___        | ___       |
| 2. I routinely review and initial lab, radiology, consultation and other reports before they are placed in patients' files.   | ___        | ___       |
| 3. I have a consistent system for notifying patients of test results.   | ___        | ___       |
| 4. If I contact patients directly with test results, I document this contact in the patients' medical record. (If my staff contacts patients with test results, they document this contact in the patients' medical records.) | ___        | ___       |
| 5. I routinely review canceled or missed appointments and follow up with patients if their failure to keep their appointments creates an increased risk of complications.   | ___        | ___       |

### IV. PROFESSIONAL PRACTICE

The most common reason for indemnity payments in malpractice claims is the determination that the physicians involved actually were negligent in their treatment of the patients--they breached the accepted medical standards of care. Staying current on the accepted standards in your specialty and being aware of common liability problems are essential to help you avoid negligence in your own practice.

Evaluate your practice on these issues of professional practice: Yes No

- |   |     |     |
|---|-----|-----|
| 1. I avoid prescribing drugs over the phone if I am not familiar with the patient's medication history. | ___ | ___ |
| 2. I actively supervise allied health professionals that are under my direction.                        | ___ | ___ |
| 3. I regularly participate in continuing medical education courses in my specialty.                     | ___ | ___ |

This self-survey, in conjunction with the Part I, is designed to allow physicians to identify areas of common risk management concerns. Taking the survey is not enough, however. Physicians who have identified areas of concern through this survey are encouraged to make changes in their style of practice. Doing so will not only enhance the quality of care provided to patients but also serve to reduce malpractice risk.

For a copy of the complete survey from which this article was derived, contact Shirley Qual, MMIC Associate Risk Management Consultant, at 1-800-328-5532.

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# South Dakota Foundation for Medical Care

## **"Do Not Resuscitate" Orders**

South Dakota Foundation for Medical Care (SDFMC), through the physician peer review process, has identified a potential problem area where hospitals may want to review their current policy for "Do Not Resuscitate" orders, if that has not occurred in the recent past.

Specific written policies should include information on how and when these "orders" are obtained from the physician. The physician is the one who makes the determination with consideration to patient and/or family wishes.

When carried out in a timely and expert manner, cardiopulmonary resuscitation is often useful in the prevention of sudden unexpected death. However, unless there are reasons to the contrary, it is usually not carried out when it merely prolongs life in a patient with terminal, incurable disease. The decision not to resuscitate a patient and decisions about the intensity of therapy and whether or not treatment is to be delivered at all to patients who are incurably and terminally ill must be reviewed frequently and must take into consideration any unexpected changes in the patient's condition.

If you have any questions or comments, please contact the Foundation office.

Gerald E. Tracy, MD  
Medical Director

S O U T H D A K O T A

June 1993  
Volume 46 Number 6

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Published Monthly by the South Dakota State Medical Association

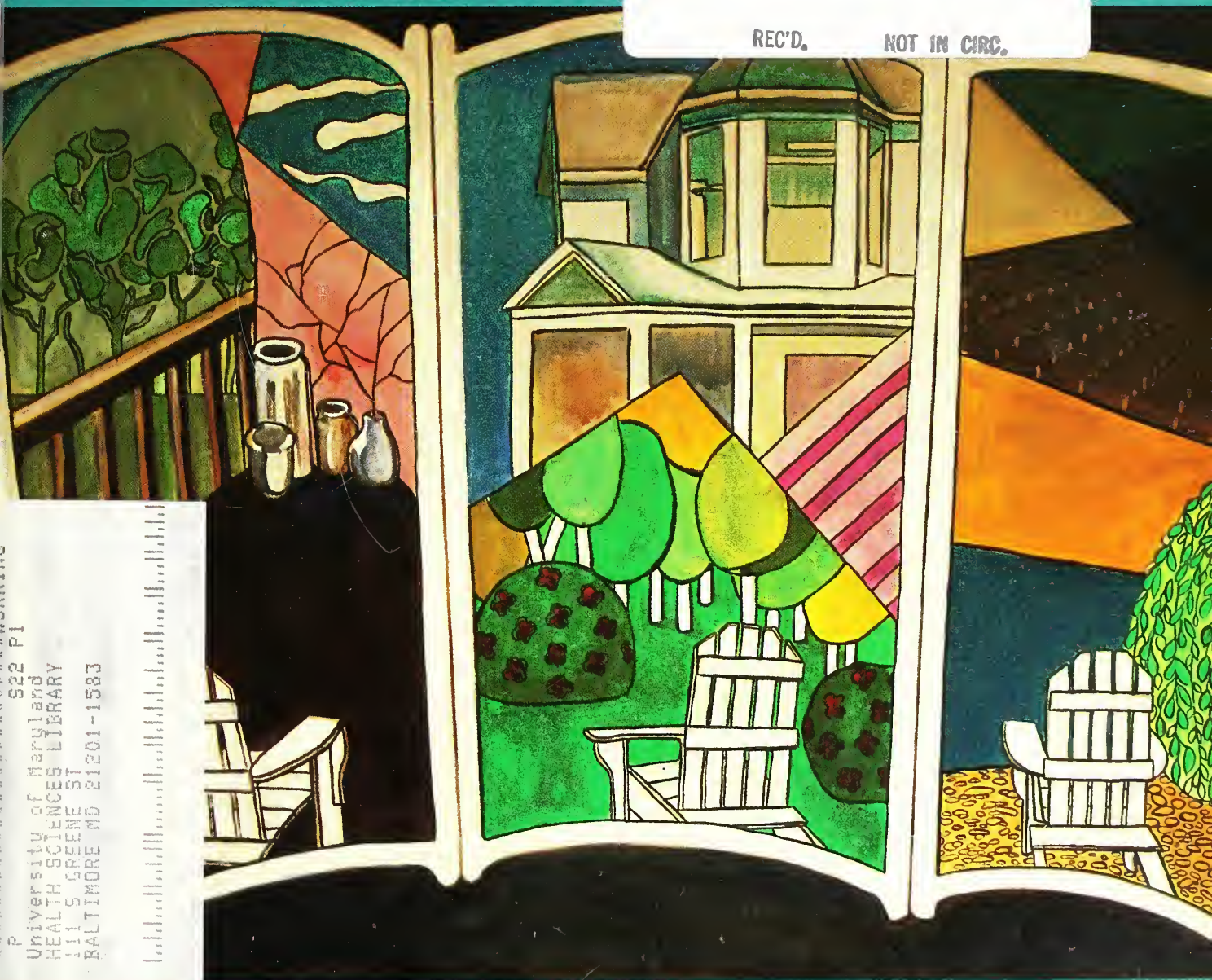
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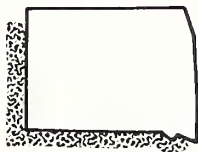
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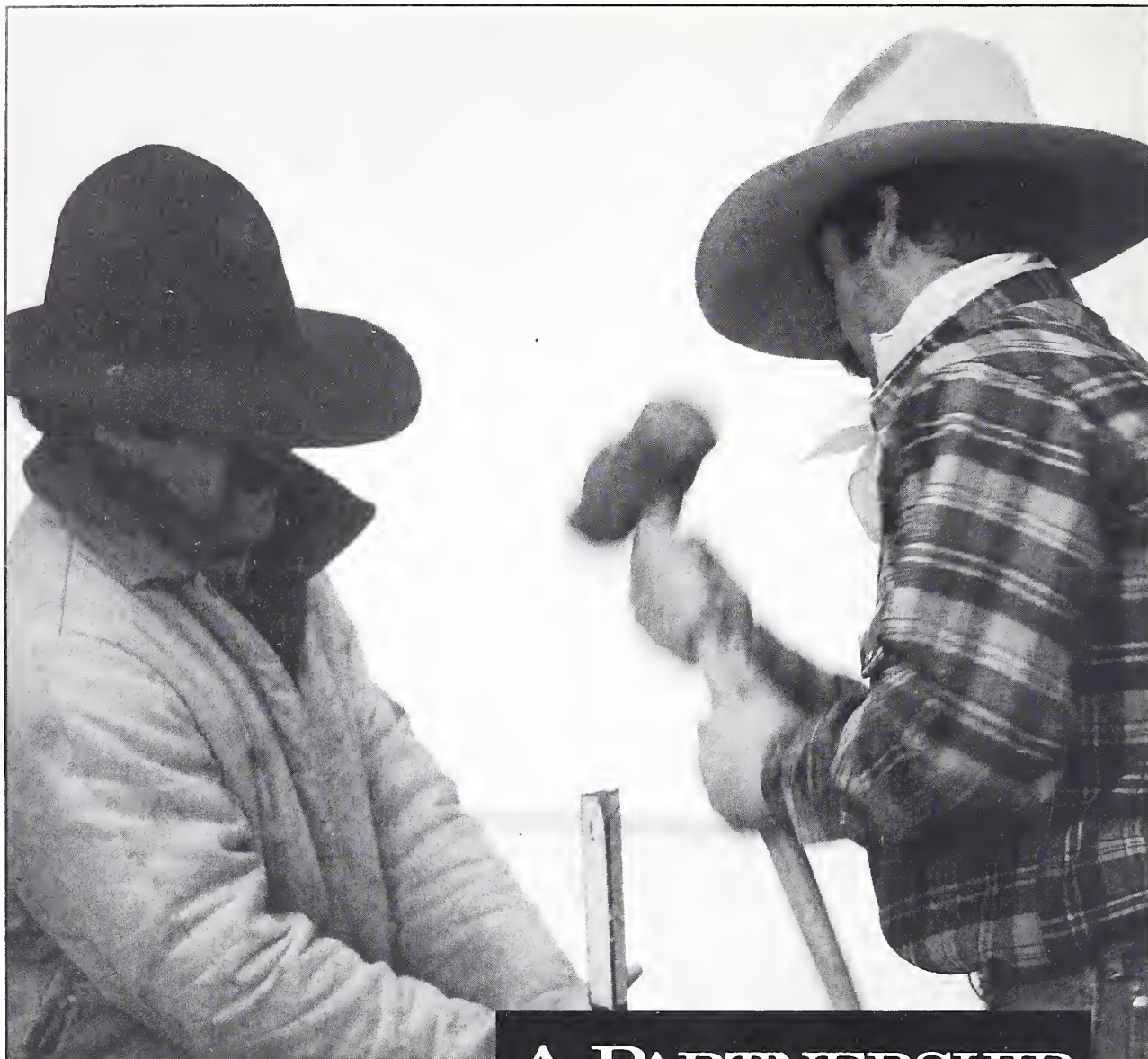
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# SOUTH DAKOTA JOURNAL OF MEDICINE

Volume 46/No. 6 June 1993

(ISSN 0038-3317)

Official Publication of the  
South Dakota State Medical Association  
the South Dakota Chapter of the  
American College of Surgeons  
the South Dakota Psychiatric Association  
of the American Psychiatric Association

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SOUTH DAKOTA JOURNAL OF MEDICINE (ISSN 0038-3317) is published monthly by the South Dakota State Medical Association, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Subscription price: \$15 per year domestic, \$18 per year foreign, \$1.75 for single copy. Second class postage paid at Sioux Falls, South Dakota 57101 and additional mailing offices. POSTMASTER: Send address changes to SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105.

NATIONAL ADVERTISING: Contact State Medical Journal Advertising Bureau, Inc, 711 South Boulevard, Oak Park, Illinois 60302. Phone: 708-383-8800.

LOCAL AND CLASSIFIED ADS: Contact Jeri Spars, SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Phone: 605-336-1965.

PRINTER: The Ovid Bell Press, Inc, PO Box 370, Fulton, Missouri 65251-0370.

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*Dept of Biochemistry and Molecular  
Biology. Edited by Ronald Lindahl, Ph.D*

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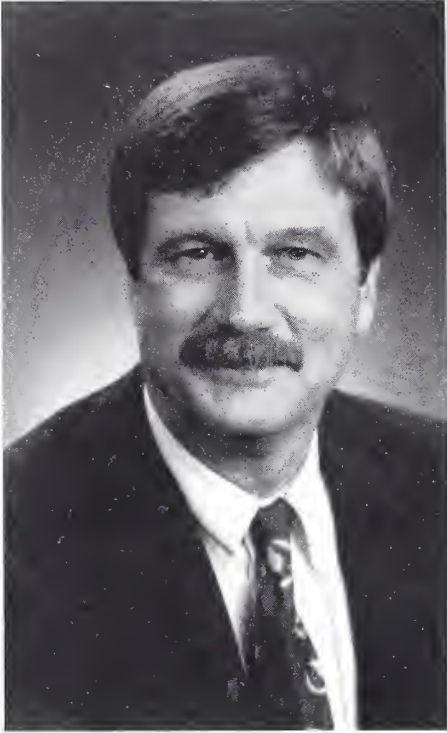
## NEXT MONTH

- Non-Immune Hydrops Associated With Congenital  
Herpes Simplex Infection

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*About the Cover*  
Painted by well known South Dakota artist, Jean Bailey, of rural Brandon, SD.  
In the past, Jean, now deceased, has given us permission to use a number of her  
paintings on the covers of this Journal.





**Thomas L. Krfka, MD, President**  
South Dakota State Medical Association

I enjoy hunting and just being outdoors. I have enough outside interests to fill every waking moment without practicing medicine.

**Thomas L. Krfka, MD, President**  
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### About Our New President

I was born in Valentine, Nebraska, and lived on a ranch in Todd County, South Dakota, until I was seventeen. I went to a one-room rural school until entering high school in Valentine, where I graduated in 1963. I attended college first at the University of Nebraska and then the University of Texas at Austin. I received my MD from the University of Texas Medical Branch at Galveston, then did an internship from hell at Denver General Hospital. After that I spent two relaxing years in Air Force as a flight surgeon. With both feet back on the ground, I did my radiology residency at the University of Colorado before moving to Rapid City in 1976.

Mollie O. and I married before I started medical school. Mollie O. is famous/infamous as a member of TRASH and as a past president of the South Dakota State Medical Association Auxiliary.

We have two daughters. Erin, our oldest, graduates from Augustana College this year. Heather is a junior at the University of Nebraska.

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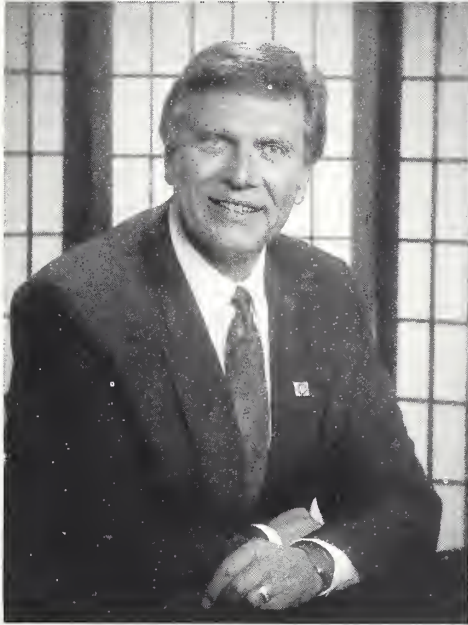
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support of all the sponsors for our 1993  
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## President's Page

I had already made several attempts to write this article on Health Care Reform before Governor Mickelson's tragic death. His death will affect the course of reform nationally as well as in South Dakota.

Governor Mickelson was co-chairman of the National Governor's Association Health Care Task Force, and had a leadership role working with the White House Task Force. He was also working with the Republican Congressional Leadership formulating the Republican response to the Democratic Reform Package. In South Dakota, he was actively promoting reform on several fronts including leading the commission I am on.

Governor Mickelson's approach utilized the groups that will be affected by reform including providers, hospitals, the insurance industry as well as the public,



Governor George S. Mickelson

and should be the model for all reform. He understood that having those affected involved gives the best chance for success and communicated with the South Dakota State Medical Association in South Dakota and the AMA nationally.

Governor Mickelson's primary concern was for the people of South Dakota. This was reflected in his commitment at all levels, from his participation with the White House Task Force to his scheduling forums in Lemmon and Winner to listen person-to-person to citizen concerns in South Dakota. In the White House

Task Force he objected, "that won't work in South Dakota," so often that Ira Magaziner began starting his comments with "this won't work in rural areas like South Dakota".

His tragic and untimely death is a tremendous blow to the rational development of Health Care Reform not only in South Dakota but also for rural areas across the country. Reform will continue but without Governor Mickelson the medical community will have to be more diligent and involved to affect positive change. I plan to stay involved with the reform process and urge all of you to become involved by communicating concerns to state and national legislators and by joining and becoming active in the South Dakota State Medical Association and the AMA. As you examine and react to the inevitable changes, please follow Governor Mickelson's example and keep the welfare of the people of South Dakota the first priority.

A memorial scholarship fund has been established.

Governor Mickelson Scholarship Fund

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### On Coping With Imperfections

An associate of mine recently hospitalized a 14 year old male with a most bizarre injury. This healthy child became entangled in his sheets and blankets during sleep and rolled off the bed and against the wall. His neck was forced into flexion and he was unable to extricate himself. He proved to have a significant spinal cord contusion and is currently left with significant arm paresis and numbness.

An even more frightening example of bad fortune was recently related to me by a pediatrician. He mentioned that he is still grieving about a 13 year old girl (perfectly healthy except for seizures) for whom he prescribed Valproic Acid. The child developed fulminant hepatic toxicity and ultimately died.

Both of these cases remind me of the poet Anne Sexton's reflection "wondering how anything fragile survives..."<sup>1</sup> In many ways, this remains a mystery. While we all know patients who live into old age unencumbered by disease and disability, other examples of devastating childhood and adult illnesses abound. While our medical interventions can successfully champion the efficacy of high technology, the frailty and fickleness of life can continue to be a confounding factor for the physician.

\*\*\*\*\*

Helping patients and families deal with life's fickleness and tragedies is demanding work, not easily mastered. But an even more daunting challenge for the physician and student is learning to cope with one's clinical errors. All too often, medical students are ill-prepared for the possibility, and indeed virtual likelihood, that they will make serious mistakes and have therapeutic failures. There is little in current medical school curricula which specifically focuses on this point. Medical students with whom I have discussed this topic concur. While most medical students are aware of physicians making mistakes, little is done to systematically prepare future physicians for the likelihood and the burden of having to personally deal with one's shortcomings.

David Hilfiker, a physician now residing in Washington, DC, recently visited Sioux Falls. Dr Hilfiker is best known for his autobiographical book, *"HEALING THE WOUNDS"*. This work recounts his experiences as a family physician in Grand Marais, Minnesota. In the book and in person, he eloquently speaks to the difficulty physicians face in being fallible and in needing to learn to deal with their mistakes in a

constructive fashion. Too often, it seems, physicians operate as if protected by a mantle of infallibility. When mistakes occur or poor judgments are made, the physician can feel forced to react with defensiveness, secrecy, and considerable emotional distress.

In the real world of medicine, all of us know that mistakes and miscalculations are inevitable. Probably none of us have gone through our medical student years, residency, and subsequent practice without making unfortunate errors. Thankfully, most of the time, these mistakes can be recognized and corrected without permanent adverse effects for the patient. But not always.

\*\*\*\*\*

In a time when health can seem like such a vulnerable gift and when it is, sometimes, a surprise how "anything fragile survives", the resilience of the human body and spirit is comforting to the caregiver. It is good for our profession, our students, and our patients if we honestly try to identify our mistakes and to learn and teach from them. And an important part of such critical self analysis is, of course, to also understand the limitations of what we can do. Given the constraints of our diagnostic abilities and the limits of human physiology, we need to be gentle with ourselves and with each other in recognizing that bad results and bizarre complications will occur and cannot always be avoided. Valproic Acid is an excellent and widely used anti-convulsant; the likelihood of it resulting in a fatality is remote. Similarly, it seems unbelievably bizarre, unlikely, and unfair that a 14 year old boy can go to bed normal and awaken permanently paralyzed. Often, our burden as physicians is to try to make sense of the fundamentally unexplainable and tragic events of life and of medical practice.

Jerome W. Freeman, MD  
Editor

---

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# Despite Intensive Efforts, Egg-Related Salmonellosis Outbreaks Continue

Ned Morton

## ABSTRACT

Reports of gastrointestinal disease, traced to bacterial contamination of foods, have recently increased in number and scope. *Escherichia coli*, a variety of *Salmonella* species and other bacterial pathogens have been isolated in many diagnoses in various parts of the country. Food trace-backs have implicated a variety of uncooked, cooked and under-cooked food sources, including cantaloupes, apple cider, ground beef, cow's milk, poultry products and even fresh, shell-in-tact table eggs. This report is intended to update the reader on control measures currently implemented for the production, processing and distribution of table eggs, specifically to control *Salmonella enteritidis*.

In otherwise healthy individuals, symptoms of *Salmonella enteritidis* (S.e.) infection can be transient. The fever, abdominal cramps and diarrhea may be of such brief duration that an afflicted person does not consult a physician. For the elderly, infants and immunocompromised, however, S.e. infection can be fatal—not only as a result of dehydration associated with diarrhea and vomiting, but also due to a frequent sequela—S.e. septicemia.

The World Health Organization has described S.e. as the cause of an international epidemic. The National Centers for Disease Control/Center for Infectious Diseases states that at least 9,455 illnesses and 46 deaths, attributed to 285 separate outbreaks of S.e. food poisoning, were reported in the U.S. between 1985 and 1990. Many of these occurred in the northeast U.S., but outbreaks have been documented across the country.

Many public health officials believe that the number of incidences reported represent a fraction of actual S.e. cases. For this reason, many public health officials encourage local physicians to consider S.e. infection in differential diagnoses of patients presenting appropriate symptoms. A definitive diagnosis can be made only through isolation and identification of the *S. enteritidis* organism.

When two or more patients are definitively diagnosed at the same time and suspected to be infected

from the same food source, public health officials may initiate a trace-back investigation. Outbreaks of S.e. salmonellosis are often associated with improper preparation, handling, storage or presentation of foods.

Frequently, S.e. contaminated table-quality (grade A) shell eggs are implicated in outbreaks. The egg production industry, beleaguered with declining consumption of eggs due to concerns about dietary cholesterol, initiated immediate action when eggs were first implicated in early cases.

The egg industry aggressively launched a comprehensive program to identify S.e. infected egg-laying flocks. Many of the flocks implicated in those trace-backs were destroyed. Also, eggs from suspected flocks were diverted to industrial food plants for pasteurization. Diversion of eggs to such marketing channels brings substantial economic penalties to producers.

At the urging of the egg production industry, a special task force was formed, supervised by the USDA. The S.e. Task Force conducts trace-backs of human salmonellosis outbreaks to identify S.e. infected egg-laying chicken flocks. The S.e. Task Force is also involved in research to identify causes of S.e. colonization of chickens and to ultimately recommend preventive measures that egg producers might adopt.

In the chicken, S.e. infection usually produces no





Figure 1

28,728X Electron Micrograph of *Salmonella enteritidis*

discernible clinical disease. Health and productivity of the bird is seldom affected or is unapparent. Researchers have determined that the organism may colonize a hen's internal organs and be incorporated in egg contents prior to shell formation.

Feral rodents, particularly mice, which are commonly associated with poultry production houses and their feed distribution systems, are thought to be a reservoir of the pathogens. Control of rodent populations in egg production facilities has been an area of prime emphasis.

Other areas of study have included measures that might prevent S.e. colonization of the hen. This has included vaccination of hens with a *Salmonella enteritidis* bacterin (killed bacteria vaccine). As part of a total control program, combining intensive sanitation and hygiene practices with vaccination has proven to significantly reduce the risk of S.e. contamination of eggs.

Producers who have been implicated in S.e. tracebacks quite commonly vaccinate new flocks with the bacterin. Those who have not been implicated in S.e. outbreaks, however, are reluctant to adopt vaccination. This may be due in part to the social stigma producers associate with the problem as well as the perception that S.e. is a "low risk" problem,

While prophylactic administration of antibiotics through feed and water is a common practice in many areas of food animal production, they are used sparingly in egg production. Nitrofurans, once com-

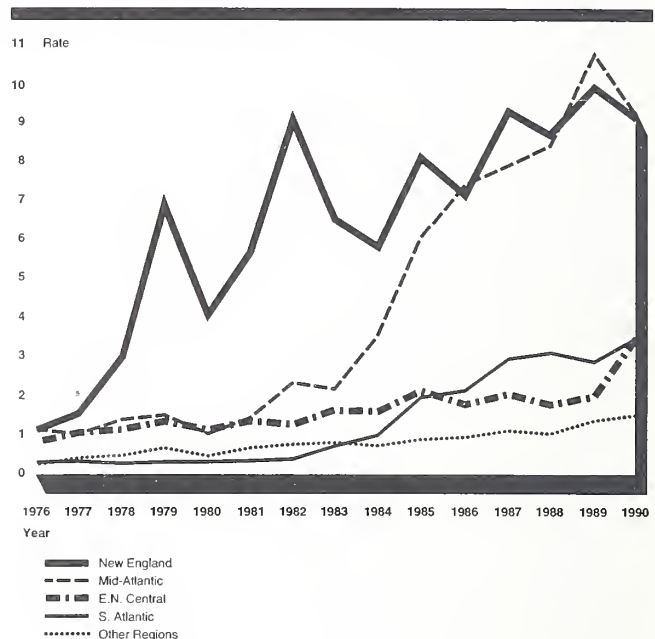
monly used to help control coccidiosis and other enteric diseases in poultry and swine, have been withdrawn from over-the-counter markets. Some veterinarians and producers believe the use of nitrofurazone may have helped reduce S.e. colonization and infection of production animals.

Prophylactic use of antibiotics, however, solely to prevent S.e. colonization of the hen, is not economically feasible. Additionally, the practice poses the risk of contaminating human food with drug residues as well as promoting drug resistance in a variety of pathogens common to food animal production.

The development of antibiotic resistant pathogens in animal agriculture is under increasing scrutiny. Many researchers believe that unregulated or poorly coordinated use of antibiotics in food-animal production may account for the development of new categories of drug-resistant pathogens. Throughout food animal production, increasing antibiotic resistance among a variety of pathogens has been reported. Many of these pathogens pose

risks to human health as well as to the economical production of meat, milk and eggs.

Many antibiotics used in animal production also have therapeutic applications in human medicine. Severe illness may result when some drug-resistant



Source: Centers for Disease Control.

Figure 1.1

*Salmonella enteritidis* Isolation Rate Per 100,000 Population by U.S. Region

pathogens are encountered by patients on antibiotic regimens prescribed for low-grade infections. Drug-resistant pathogens may flourish in human hosts whose natural intestinal microflora have been debilitated through protracted antibiotic use.

Historically, many physicians have been reluctant to prescribe broad-spectrum antibiotics for patients afflicted with salmonellosis due to the risk of establishing persistently infected carriers of antibiotic-resistant organisms. S.e. infection, however, frequently leading to life-threatening septicemia, may pre-empt such precautions when the elderly, infants or immunocompromised individuals are infected. Prompt initiation of therapy, using antibiotics to which S.e. have demonstrated sensitivity, should be considered.

As with most salmonella serotypes, *S. enteritidis* is quickly destroyed by common disinfectants and heat as well as a variety of (but by no means, all) antibiotics. At room temperature, *S. enteritidis* can divide every 15 to 30 minutes; sometimes increasing tenfold in an hour. At approximately 45° F, or less, however, the organism stops reproducing. While it may survive freezing and desiccation, sustained temperatures above 120° F (four minutes or more) will kill the organism.

For these reasons, federal and state agencies encourage egg producers, preparers and consumers to store and handle eggs appropriately. Consumers are advised to keep eggs refrigerated prior to use and to cook them promptly and thoroughly. Many popular recipes, however, such as Caesar's salad, hollandaise sauce, eggnog and many others require fresh, raw eggs.

Many consumers are unaware of the risk of S.e. contaminated eggs. Others judge the risk to be of such low priority that they do not alter their food preparation and dietary habits. Salmonellosis due to S.e., however, occurs frequently across the country. Several public health officials have encouraged physicians to consider the prevalence of S.e. infection when diagnosing patients that present gastrointestinal disorders symptomatic of S.e. infection.

Additional information on the S.e. epidemic is available from the U.S. General Accounting Office, 202/275-6241 and also from the Division of Bacterial and Mycotic Diseases, Center for Infectious Diseases/Centers for Disease Control, 1600 Clifton Road, Atlanta, GA 30333.

Facts About S.e. and Eggs

- At room temperature, S.e. can divide every 15 to 30 minutes; increasing as much as tenfold in an hour.
- While S.e. may be capable of surviving freezing and desiccation, the organism stops reproducing at temperatures below 45° F.
- S.e. cannot survive temperatures above 120° F (temperatures normally achieved with thorough cooking).

- 9,455 illnesses and 46 deaths in the U.S. between 1985 and 1990 were attributed to S.e.
- The average laying hen produces 250-252 eggs each year.
- The northeast U.S. (where the majority of S.e. outbreaks have been reported) accounts for approximately 21% of total U.S. human population and approximately 15% of total U.S. egg production.

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| California  | 28,960,000 | Missouri       | 6,532,000  |
| Colorado    | 3,473,000  | Nebraska       | 5,680,000  |
| Connecticut | 3,617,000  | New York       | 3,687,000  |
| Florida     | 10,249,000 | North Carolina | 13,091,000 |
| Georgia     | 17,976,000 | Ohio           | 17,633,000 |
| Illinois    | 3,178,000  | Oklahoma       | 3,684,000  |
| Indiana     | 19,846,000 | Pennsylvania   | 18,934,000 |
| Iowa        | 9,047,000  | South Carolina | 5,458,000  |
| Kentucky    | 1,903,000  | South Dakota   | 2,294,000  |
| Louisiana   | 1,135,000  | Texas          | 13,922,000 |
| Maine       | 3,956,000  | Virginia       | 3,843,000  |
| Maryland    | 3,496,000  | Washington     | 4,855,000  |
| Michigan    | 5,203,000  | Wisconsin      | 3,310,000  |

AUTHOR

Free lance writer in Veterinary Sciences. Sioux Falls, SD.

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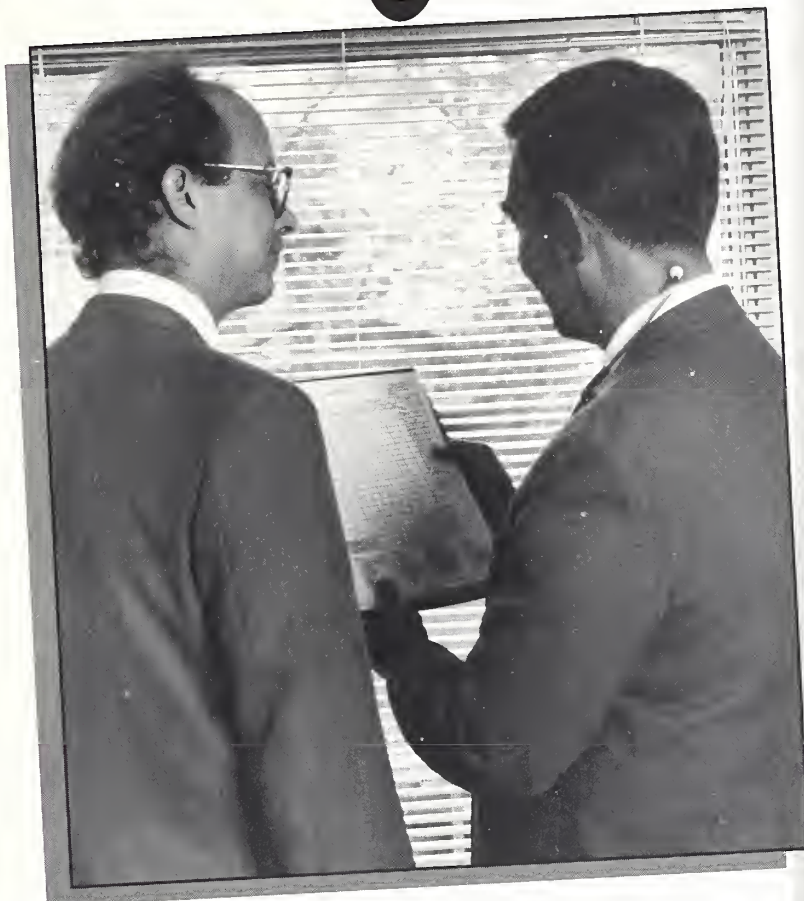
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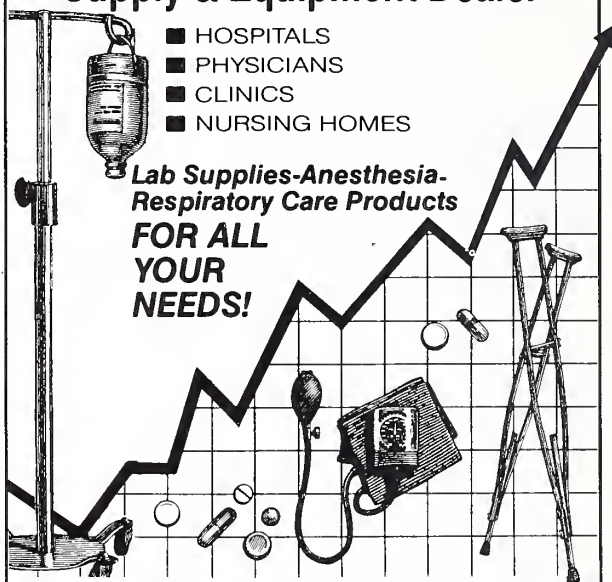
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# Molecular Medicine: A Primer for Clinicians

## Part III: Molecular Tools for Analyzing Human Genes

*Department of Biochemistry and Molecular Biology. Edited by Ronald Lindahl, Ph.D*

### ABSTRACT

This is the third paper in our series on how today's practicing clinician is affected by the concepts of molecular medicine. Described are the major tools of molecular biologist, previously used primarily in basic research, that are finding widespread application in the day-to-day practice of medicine. Discussed are Southern and Northern analyses, restriction fragment length polymorphisms, the polymerase chain reaction and in situ hybridization as applied to clinical problems.

### INTRODUCTION

The third paper in our series on molecular medicine continues to describe some of the basic methods of molecular biology that can be applied to clinical situations. Last month we discussed the isolation of specific human genes, either from genomic or cDNA libraries.<sup>1</sup> We also described DNA sequencing and its utility in characterizing new genes. This month, we will examine additional methods that can be used to characterize newly identified genes. Variations of these techniques have already found widespread application in molecular medicine. Readers are referred to the earlier papers in this series and the references cited therein for additional background.<sup>1,2</sup>

### SOUTHERN AND NORTHERN ANALYSIS

The technique of electrophoresis has already been discussed in describing DNA sequencing. A number of other aspects of molecular biology also rely on the separation of DNA molecules by electrophoresis. (Figure 1) Recall that electrophoresis is the separation of macromolecules based on their mobility in an electric field. For nucleic acids, movement in an electric field is inversely proportional to the length of the linear molecule, especially if the electrophoresis is performed in some semi-solid medium such as agarose or polyacrylamide. Therefore, shorter DNA or RNA molecules migrate more rapidly than do larger molecules. Thus electrophoresis results in a spectrum of molecules separated by size. Resolution down to single base pair differences can be achieved, as in DNA sequencing.

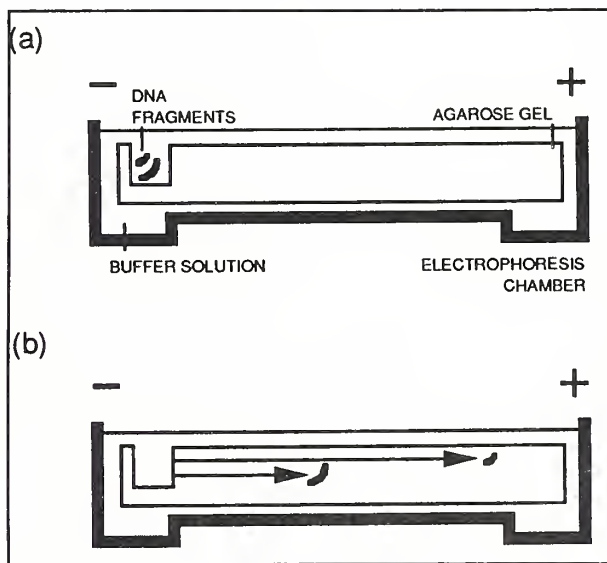


Figure 1

Electrophoresis of nucleic acids. - and + represent the cathode and anode, respectively. Adapted from *DNA Science* by Micklos and Freyer with permission.

The electrophoretic separation of populations of DNA or RNA molecules and identification of particular molecules within the population are quite useful in many aspects of molecular medicine. The basis of many such analyses are "Southern blot" analysis of DNA or "Northern blot" analysis of RNA. (Figure 2) Southern analysis is named after E. M. Southern who developed the method of transferring (or blotting)



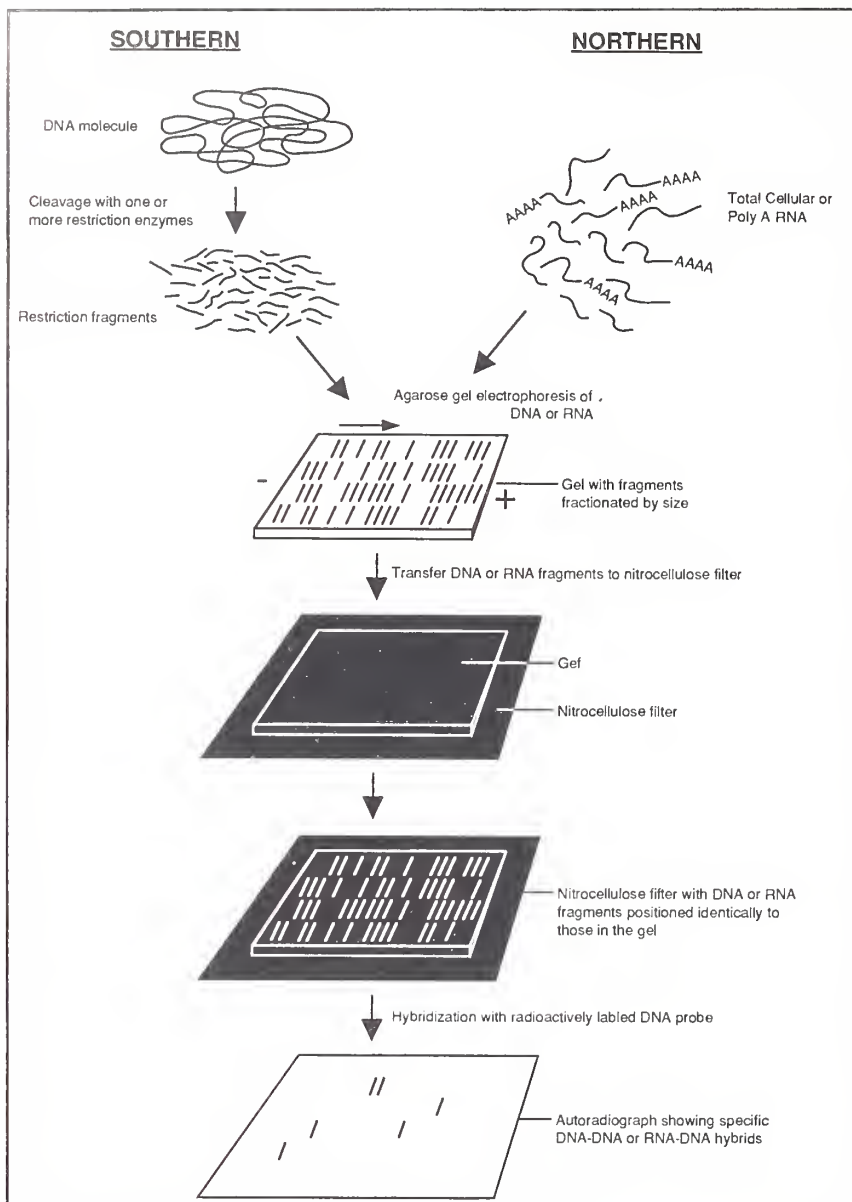


Figure 2

The techniques of Southern and Northern analysis. Modified from *Biochemistry* by Mathews and van Holde with permission.

separated DNA molecules onto a nitrocellulose or nylon filter and identifying a particular DNA molecule from among the entire population using radioactive, specific, complementary probes.<sup>3</sup> The term "Northern" analysis was coined for the examination of RNA populations to contrast it from Southern analysis.

As for DNA cloning and sequencing, the molecular basis of Southern and Northern analysis is complementary base pairing of nucleotides. Recall that the two strands of a DNA double helix or the DNA-RNA hybrid helix transiently formed during transcription are held together only by hydrogen bonds. Although their large number make the double helix very stable, hydrogen bonds can be easily disrupted by heat. There-

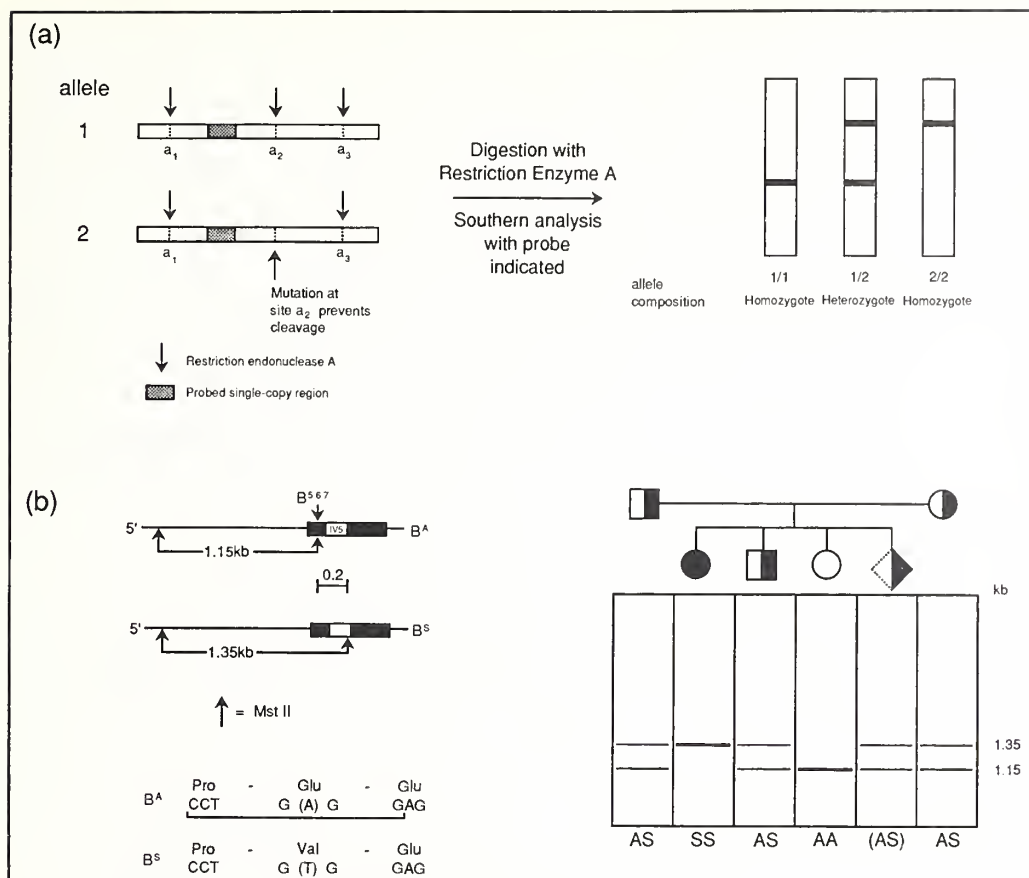
fore, if a DNA molecule is heated to above about 80°C (175°F), the hydrogen bonds will break and the two strands of the helix will separate. If the heated DNA is allowed to cool slowly, random interactions between bases on the two strands result in new hydrogen bonds being formed. Since adenine-thymine and guanine-cytosine hydrogen bond pairs are most stable, only when long stretches of complementary base pairs form will new stable double helices be regenerated. In essence, only when two complementary strands are aligned exactly will double helix formation occur. If, following heat denaturation of DNA or RNA, a radiolabelled, single stranded, probe DNA molecule is added to the cooling mixture, the probe will compete for binding to its complementary sequence. This results in the formation of radiolabelled target DNA-probe hybrid which specifically identifies a single DNA molecule in a very large population.

Stable, double-stranded complexes of target DNA or RNA and the probe molecule will form only when the base pairing homology is quite extensive. Therefore, conditions for the formation of target-probe hybrids can be established that will allow stable target-probe duplexes to form only when the homology is exact along the entire length of the duplex. Alternatively, conditions can be established that will allow varying numbers of mismatched base pairs to exist within the duplex. The more "relaxed" the hybridization condi-

tions, the greater the ability to detect DNA sequences related to, but not exactly matching the probe. For some applications, such as searching for new genes by positional cloning or reverse genetics, or identifying the human homolog of genes previously isolated from other species, more relaxed conditions may be used to advantage. Often however, the more stringent the hybridization conditions are, the better it is for genetic screening for disease alleles or forensic DNA testing.

## RESTRICTION FRAGMENT LENGTH POLYMORPHISMS

One very powerful application of the electrophoretic separation of DNA to molecular medicine is Restriction Fragment Length Polymorphism or RFLP



**Figure 3**

**Restriction Fragment Length Polymorphism analysis.** (a) The general approach to RFLP analysis. Electrophoresis of restriction enzyme-digested DNA samples detects the presence or absence of restriction enzyme sites, judged by Southern analysis. (b) The application of RFLP analysis for detection of normal or sickle-cell globin gene alleles in a family. The presence or absence of sickle-cell diseases or carrier status confirms the association of the RFLP with the disease.

analysis.<sup>4</sup> (Figure 3) As the name implies, this method involves digestion of total genomic DNA with one or more restriction enzymes, resolution of the resulting DNA fragments by electrophoresis, and Southern analysis using specific probes. The probe can either be an oligonucleotide or can be derived from a cDNA, depending on the particular application. The probe detects the presence or absence of particular restriction enzyme recognition sites within the sequences with which the probe hybridizes.

If an individual has two identical alleles for a gene, restriction enzyme digestion will produce a characteristic pattern when examined by Southern blotting with an appropriate probe that includes the restriction site. (Figure 3) If an individual carries two different alleles for the same gene, and the alleles differ by the presence or absence of a particular restriction enzyme site, the digestion pattern will be different from the homozygous individual.

For example (Figure 3b), the absence of an MstII restriction site within the B-globin gene is diagnostic for the presence of sickle-cell disease. In this particular

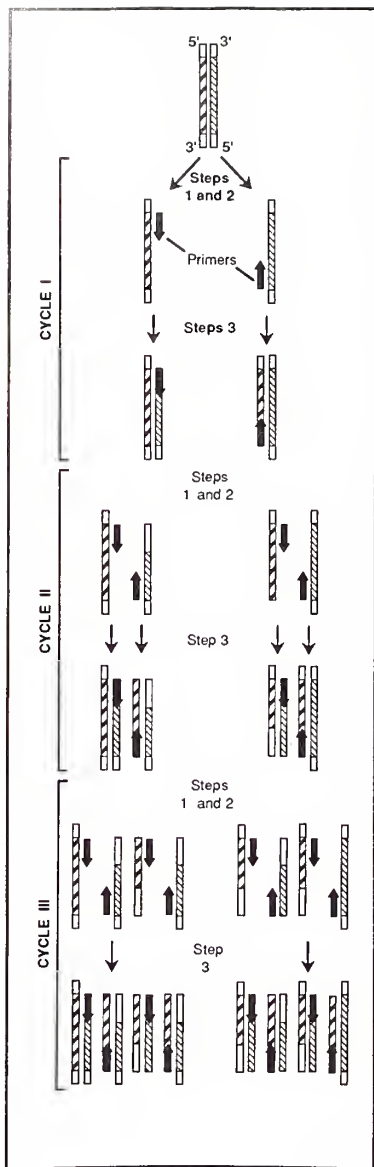
case, an MstII site is present in the normal B-globin gene. The mutation responsible for the glutamate to valine substitution to produce sickle-cell globin (codon 6 from GAG to GTG) also destroys the MstII restriction site. All three genotypes, homozygous normal globin, homozygous sickle-cell globin and the heterozygote are all readily detectable on a Southern blot of MstII-digested genomic DNA probed with a DNA fragment complementary to the region containing the MstII site. The absence of the MstII site identifies both afflicted individuals and carriers.

When different restriction enzymes are used to digest a number of DNA

samples and these are examined with the same probe, patterns of restriction site distribution differences, or polymorphisms, merge. Since one pattern for each gene is most common in a population of many individuals, it becomes the normal or "wild type" pattern. Any deviant pattern may have predictive value.

As with any other polymorphism, many RFLPs are without biological effect, but show characteristic patterns which may have many uses in molecular medicine.<sup>5</sup> Other RFLPs reflect mutations in the gene of interest that are directly related to the etiology of a particular disease. Often a particular polymorphism in a certain gene is predictive of a disease state, as are mutations in some oncogenes, such as p53, and certain cancers. The presence of certain polymorphisms can also be used to identify carriers of a genetic disease and RFLP analysis then becomes useful as a screening tool, as in CF and Duchenne's muscular dystrophy. If applied to fetal tissues, RFLP analysis can be used to diagnose certain genetic diseases in utero. Restriction polymorphisms in closely linked genes may be used to identify carriers or afflicted individuals for genetic dis-





**Figure 4**

**The Polymerase Chain Reaction.** Steps 1 and 2 are the heat denaturation of double-stranded target DNA (Step 1) followed by hybridization of specific primers that border the DNA sequences to be amplified (Step 2). Step 3 is the replication of DNA from the primers by DNA polymerase. Each cycle consists of each step, 1 to 3. Subsequent cycles begin with repeating steps 1 and 2 on the double-stranded DNA products of the previous cycle, followed by step 3. After 20 to 30 cycles, several million copies of the original target sequence have been produced. Modified from *Biochemistry* by Mathews and van Holde with permission.

eases for which the gene has not yet been identified. Forensic medicine has also benefitted from RFLP analysis in the form of "DNA fingerprinting".<sup>6</sup> In this case, RFLP patterns at several different genes can be used to establish the identity or relationship between DNA obtained from minute amounts of tissue found at a crime scene and DNA of the victim and potential suspects. RFLP analysis can also determine paternity.

## POLYMERASE CHAIN REACTION

One of the newest additions to the techniques of molecular medicine is the Polymerase Chain Reaction or PCR.<sup>7</sup> (Figure 4) This method allows the amplification of a DNA or RNA sequence without cloning it. Therefore, PCR can be used to directly select a particular DNA sequence of interest from total genomic DNA or mRNA from very small samples, for example, a single skin or white blood cell, or a single hair. PCR does require some knowledge of the nucleotide sequences that lie on either side of the sequence of interest. Oligonucleotide se-

quences complementary to the flanking sequences are prepared, hybridized to heat-denatured DNA, and used as primers to direct DNA synthesis across the region of interest using a special DNA polymerase. The number of copies of the DNA of interest increases exponentially. If the denaturation-primer hybridization-polymerization reaction is allowed to proceed for many (20-30) cycles, several hundred million copies of a single initial sequence can be obtained. The entire process can be done in a matter of hours. The resulting amplified DNA can be inserted into an appropriate vector and further manipulated as described above.

The potential applications of PCR in molecular medicine are numerous.<sup>8</sup> For example, it is being used to detect infectious agents such as the human immunodeficiency virus. PCR-based diagnostic tests are

**TABLE I**

### Key Terms Used in Molecular Biology

|   |   |
|---|---|
| Electrophoresis                                 | Separation of DNA or RNA molecules according to size in an electric field   |
| Hybridization                                   | Detection of specific DNA or RNA molecule of interest by a suitable probe based on complementary base pairing of single stranded nucleic acids.   |
| Southern Analysis (Blotting)                    | Technique in which a population of DNA fragments separated by electrophoresis is transferred to a filter and specific DNA fragments identified by hybridization with an appropriate probe |
| Northern Analysis (Blotting)                    | Identical in method to Southern blotting except a population of RNAs is separated and a specific RNA fragment is detected   |
| Restriction Fragment Length Polymorphism (RFLP) | Detection of allelic variants at restriction enzyme sites by Southern Analysis  |
| Polymerase Chain Reaction (PCR)                 | Exponential amplification of a DNA sequence of interest by repeated cycles of replication by DNA polymerase   |
| Flourescent In Situ Hybridization (FISH)        | Use fluorescently labelled probes to directly detect specific DNA or RNA sequences in cells   |

also being developed which specifically detect altered oncogenes, such as mutant forms of P53 or ras. Screening tests for a variety of genetic diseases, such as cystic fibrosis or apolipoprotein defects, based on the PCR detection of mutant alleles are, or will soon be, available to the clinical geneticist.

## **In Situ HYBRIDIZATION**

Another technique that may soon find widespread applications in molecular medicine is Fluorescent In Situ Hybridization (FISH).<sup>9</sup> This method employs fluorescently labelled oligonucleotide probes to detect numerical chromosome level defects in interphase cells. Conceptually FISH is based on the same principles as Southern analysis and PCR. It requires denaturation of DNA to its single-stranded form and specific hybridization of the labelled oligonucleotide probe to its complementary sequence.

The technique can be done on intact chromatin in the nucleus of non-dividing cells in tissue sections. Thus, the need for culturing actively dividing cells to produce metaphase chromosomes, as is done in karyotyping, is eliminated. It seems likely that fluorescent probes suitable for the allele-specific, direct detection of activated oncogenes or tumor suppressor genes or genetic diseases in somatic cells will soon be available.<sup>10</sup> Such probes would be particularly useful to the obstetrician, pediatrician and pathologist.

We have now described all the major techniques of molecular biology that are being applied in molecular medicine. In the next paper in this series we will discuss how identification of the cystic fibrosis gene by molecular techniques has directly affected clinical practice.

## **AUTHORS**

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Coordinating discharge efforts between the hospital and the patient's physician is essential in assuring the success of discharge planning efforts. The hospital should assure the follow-up plans consider such patient needs as activity, medications, diet disposition, and follow-up care. The hospital should contact the patient's physician when a potential inconsistency in care plan is noted or when unaddressed post hospitalized patient care needs appear to have been inadvertently overlooked.

A timely and concise summarization of the patient's care will also serve in assuring that appropriate discharge plans have been made for the patient's health care problems.

The discharge summary includes the concise recapitulation of the reasons for the hospitalization, the significant findings, the procedures performed and treatment rendered, the condition of the patient on discharge, and any specific instructions given to the patient/family. Consideration should be given to instructions relating to physical activity, medication, diet, disposition, and follow-up care. Lab work still awaiting report at the time of discharge should be noted as well as any unstable conditions present at discharge.

Gerald E. Tracy, MD  
Medical Director

### The Placebo Effect

Brian Kaatz, Pharm.D, Sioux Falls, SD.

The power of placebos has been recognized and used for centuries. They were successfully utilized well before research validated (by our contemporary standards, at least) the far reaching effects that placebos have. In a letter written during his presidency, Thomas Jefferson wrote, "one of the most successful physicians I have known has assured me that he used more of bread pills and colored water than all other medicine put together". Jefferson called placebos a "pious fraud".

Studies consistently have revealed a pharmacologic response for placebos that is significant, often in the 30% range. The response typically follows the effect of the drug that the placebo was proposed to mimic. Interestingly, in addition to subjective responses such as anxiolysis and sleep, there has been documentation of objective physiologic responses such as blood pressure, heart rate, cholesterol level, and blood sugar changes due to the administration of placebo. Furthermore, response is consistent regardless of whether the subject has the condition being treated or not. In other words, if there is a patient who is bothered by insomnia and a second subject who is not, both are more or less equally likely to obtain a sleep producing effect from placebo if they are both told the drug is a hypnotic. Thus, this modality is not an appropriate way of uncovering whose condition is being faked or is hypochondriacal.

The use of placebos has been ethically questioned when used for therapeutic ends in individual patients. Some physicians contend that the relatively risk-free effects of these agents are too powerful to disregard. If a satisfactory effect is achieved, why not use it? Others hold that the use of placebos is grounded in patient deceit and, even if some short term goal is realized, the risk of future physician or pharmacist mistrust is greater than any immediate gain. There likely needs to be consideration of both these short and long-term consequences before placebo use is attempted.

The automatic use of placebos in randomized clinical trials has also been occasionally challenged. Does a new drug for migraine headaches need to be paired with placebo, for example, to demonstrate efficacy? Does the quest for scientific purity in this example result in undue pain and discomfort in placebo recipients? Similarly, there are problems when promising new therapies are randomized against placebo in conditions that are nearly universally fatal. An example of this was the controversy generated from the use of placebos in the 1970's as a control group in the study of

vidarabine, then the only drug useful in herpes encephalitis. Might historical controls suffice when studying a disease that quite likely will be fatal, so that all patients will be able to get the trial drug? Study drugs for AIDS and multiple sclerosis are current relevant examples. While these issues remain important, some insight might be tendered for the first scenario we mentioned—that of placebo use in clinical practice.

Along with the "proof" that placebos have an amazing ability to render pharmacologic effects came another discovery. Prescriptions offered at the hand of an encouraging and supportive physician had a much greater effect than those from an indifferent prescriber. The emotional support and confidence that should come hand-in-glove with a prescription, carries with it an enormous power to influence outcome, akin to responses that can be documented from placebos. Not only do these responses occur with placebos, it is quite likely they occur with the usual use of "real" pharmacologic agents, and can have much to do with their success. Thus it is likely that we can often legitimately differentiate the placebo from the "placebo effect", to the point of capitalizing on the "effect" with any prescription drug, or even without any drug or placebo at all.

From this wandering look at placebos, perhaps a conclusion could be drawn by anyone who daily works with people and drugs. Prescribing and dispensing drugs (or placebos) should not be regarded as an act separate from actions that build up a healthy relationship with a patient. Carefully listening and legitimizing the patient's complaints will go a long way toward both building a successful relationship with a patient, and the successful use of drugs. Encouragement needs to be part of the prescription. We can call this the wise use of drugs, good medicine, or the placebo effect. Regardless, showing concern for the patient and confidence in the drug bestows amazing power to the process. Maybe then we can partake in the piety with little of the fraud.



Edited by Brian Kaatz, Pharm.D.





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**Patti Herlihy, President, South Dakota  
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### WHY?

I feel very somber as I write this first article. We are all forced to face a major loss; we will never replace Governor George S. Mickelson and his seven companions who perished with him. But South Dakota will survive and must learn from this tragic experience.

Life can be very unfair; we never know what may occur next. This is precisely why we must live to the fullest now; make our contribution today as we may lose the opportunity tomorrow. Governor Mickelson died in the service of our state; he was committed to each one of us. And each of us, in our own way, should be willing to return to society a part of ourselves. How we choose to contribute will take many different forms. But as long as we feel confident that we are doing our share, we should experience satisfaction and fulfillment.

As physicians and spouses of physicians, we have a multitude of opportunities in which to invest our time and talents. Hopefully, supporting the South Dakota Medical Association and the South Dakota Medical Association Auxiliary will be high on our list. Linda Mickelson is a prime example of a spouse who was tireless in her efforts to lend her support and encouragement to her husband's endeavors. We can all learn from her. As auxiliaries, we are there to support

and encourage, but even more, to develop programs and policies to promote medicine when our spouses need that assistance. And, ultimately, we must take charge when we see the need to fill the gap or to forge ahead if our own convictions dictate such a move.

Why should we want to be involved in the auxiliary? So many demands are placed upon our precious time. First and foremost, we need one another — we are social beings needing support and understanding. Paradoxically, we are unique, we need our own identity. As medical spouses, we can appreciate how vital it is to be welcomed for our own selves and our own contributions, whether they involve our career or chosen volunteer activities. An "outsider" could not understand this dilemma. Because of the demands placed upon our spouses, we must develop security within ourselves. We often must show up at a PTA meeting alone, a fund-raiser or even a dinner party. But we must also appreciate the stress our spouses must deal with daily and help them to cope also. Our children must also learn to develop their own identity, to be strong unto themselves. The entire family must be independent and resourceful. Someone not experiencing these added stresses to daily life could never begin to comprehend these issues; that is why we need one another.

We are all proud to be South Dakotans. We come from a state of strong individuals who have often been forced to make it on their own or not at all. We have learned to depend on our own resources simply because there may be no other alternative. The death of George S. Mickelson has affected each one of us deeply. I heard a newsman comment that even though we may not have met him personally, we always felt close to our Governor; he was accessible. That is the blessing of a small state. And this is the lesson we must learn. We cannot pass up the chance to help and to do what we feel is necessary, whatever that may be. Otherwise it may be too late.

*Patti Herlihy*



## *This Is Your Medical Association*

**Bruce Brookman, MD**, of Wagner, died May 8, 1993. He was born July 19, 1915, in Trenton, NJ. At some time in his early years, his family moved to Vermillion. He received his master's degree from the University of South Dakota. While attending USD, he participated in the 1939 National Science Fair in Chicago, where he exhibited his award-winning science project of an artificial heart pump. He graduated from USD in 1940, and went on to receive his medical degree from the University of Tennessee College of Medicine in 1943. He completed an internship at the John Gaston Hospital in Memphis. In 1944, Dr Brookman joined the Army Medical Corps and after his discharge in 1947, he began his practice of general medicine in Chamberlain. He also practiced in Blytheville, Arkansas before moving to Wagner, where he practiced until his retirement in 1987.

He married Troy Nell in Augusta, Georgia in 1946, where she was stationed as a member of the Army Nurse Corps. He was an active member and past president of the Wagner Rotary Club, a member of the Masonic Lodge and he and his wife belonged to the Eastern Star. He was a member of the South Dakota State Medical Association and the American Medical Association. He attended the Wagner United Methodist Church. He received a Citizen of the Year Award in 1981, the VFW Loyalty Day Award and was co-Labor Day Parade Marshall in Wagner. He was one of the first Eagle Scouts from Vermillion.

Survivors include his wife; one son: Phillip of Apple Valley, Minn, and two daughters: Mrs Dale (Janelle) Margeson of Wall Lake and Mrs Stanley (Rosemary) Peters of Wagner; seven grandchildren and two great-grandchildren.

**Drs Jerome W. Bentz** of Platte, **Michael P. Crandell** of Kennebec, and **Bernard Heilman** of Madison have completed continuing medical education requirements to retain active membership in the American Academy of Family Physicians, the national association of family doctors.

\*\*\*\*\*

**Stephen Manlove, MD**, psychiatrist and internist in Rapid City, completed second National Board Certification, certifying him as a diplomate of the American Board of Psychiatry.

\*\*\*\*\*

**John Vidoloff, MD**, specialist in physical medicine and rehabilitation in Aberdeen, has been appointed an

assistant professor at the University of South Dakota School of Medicine. Dr Vidoloff will be available to instruct medical students who are situated in Aberdeen.

\*\*\*\*\*

**Robert Preston, MD** of Rapid City, has passed a certification examination administered by the National Medical Review Officer Certification Council. This certification qualifies him to review drug and alcohol test results in occupational medicine.

\*\*\*\*\*

**Dr Jeanne Bennett**, internist at Rapid City Regional Hospital, became board certified by the American Board of Internal Medicine.

\*\*\*\*\*

The American College of Obstetricians and Gynecologists invited **Samir Abu-Ghazaleh, MD**, to lead two luncheon conferences at the 41st Annual Clinical Meeting of the American College of Obstetricians and Gynecologists in Washington, DC. Dr Abu-Ghazaleh is in private practice at the Dakota Midwest Cancer Institute in Sioux Falls. He is the only board certified gynecologic oncology specialist in the state. He is also board certified in obstetrics and gynecology.

\*\*\*\*\*

**Scott Eccarius, MD**, a clinical assistant professor of ophthalmology with University of South Dakota School of Medicine and an ophthalmologist at the Rapid City Regional Hospital, recently completed a course on advanced glaucoma treatment laser surgical approaches. This laser technology is the first laser technology of its kind in South Dakota.

\*\*\*\*\*

**Dr O. Myron Jerde** of Piedmont and **Dr Robert C. Goodhope** of Sturgis, have been elected to Fellowship in the American College of Physicians, the professional organization of internists.

\*\*\*\*\*

Royal C. Johnson Veterans Memorial Hospital announced that **Jessie K. M. Easton, MD**, chief, Rehabilitation Medicine Service, was awarded the Government Employees Insurance Co. Public Service Award for her work in physical rehabilitation.

\*\*\*\*\*

**Dr Marlin Lamb**, a physician in the Emergency Department at St. Luke's Midland Regional Medical Center in Aberdeen, has been chosen president-elect of the South Dakota Chapter of the American College of Emergency Physicians for 1994. He is currently serving as vice president of the organization.

S O U T H E A S T

# JOURNAL OF MEDICINE

Published Weekly by the American Medical Association

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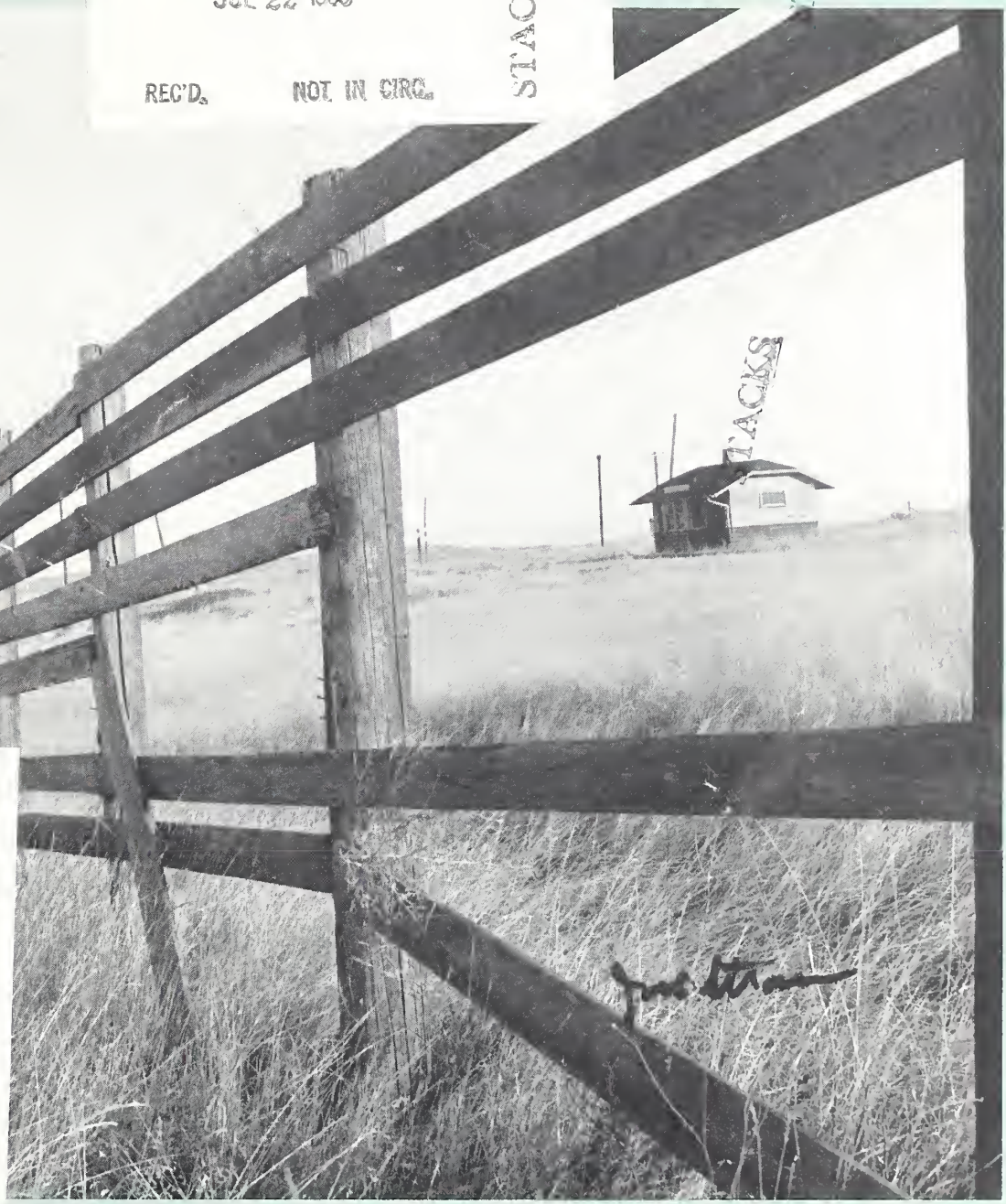
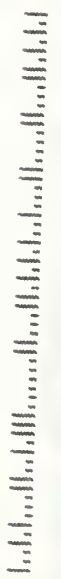
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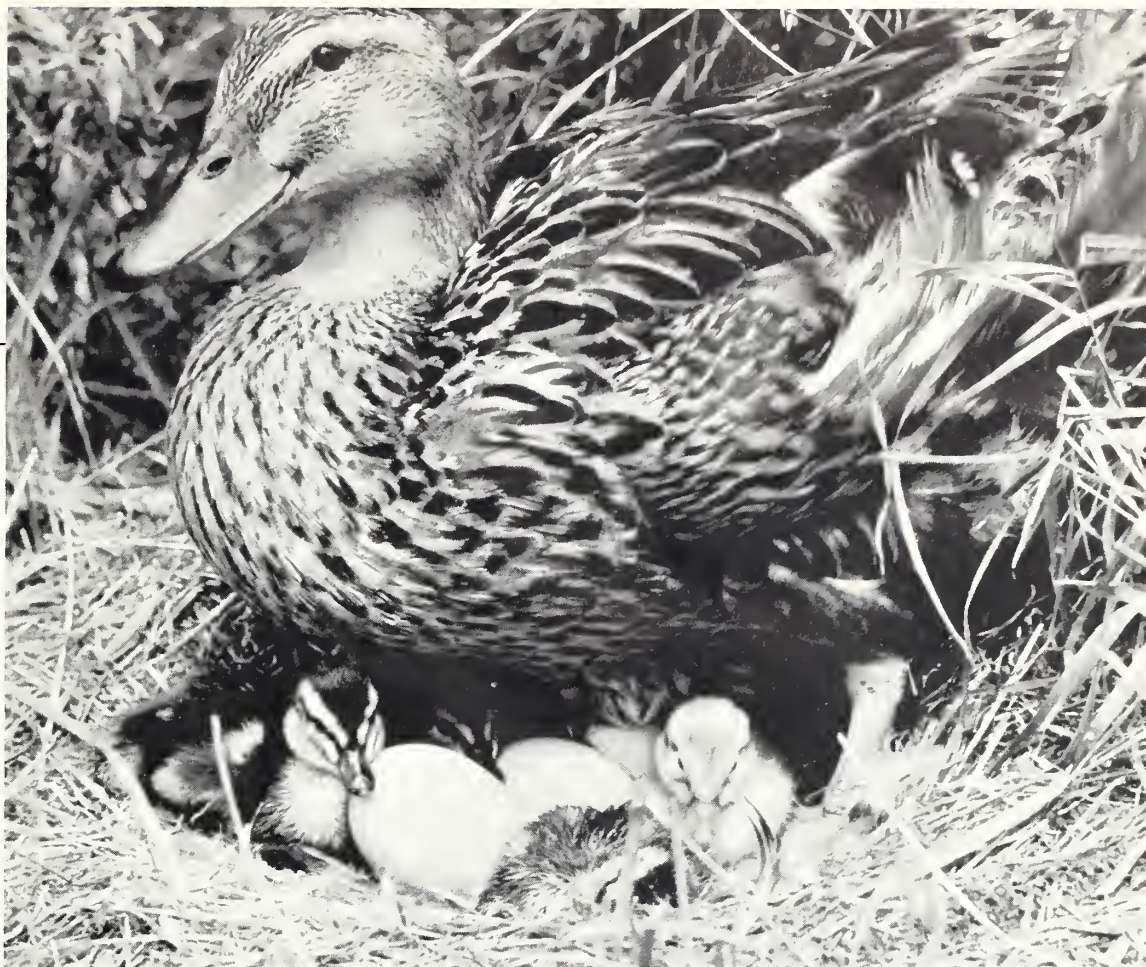
*The primary purpose of the South Dakota Medical School Endowment Association is to provide low interest (6%) loans to medical students who are attending the University of South Dakota School of Medicine. In the past few years we have increased available loan money from \$35,000 to \$70,000 for 1992-93. Student needs are increasing each year, reflected by the increase in the number of loans from 35 to nearly 60. More contributions are needed to ensure continued growth in our loan assistance.*

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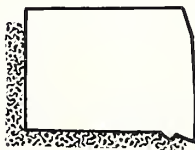
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# SOUTH DAKOTA JOURNAL OF MEDICINE

Volume 46/No. 7 July 1993

(ISSN 0038-3317)

Official Publication of the  
South Dakota State Medical Association  
the South Dakota Chapter of the  
American College of Surgeons  
the South Dakota Psychiatric Association  
of the American Psychiatric Association

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SOUTH DAKOTA JOURNAL OF MEDICINE (ISSN 0038-3317) is published monthly by the South Dakota State Medical Association, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Subscription price: \$15 per year domestic, \$18 per year foreign, \$1.75 for single copy. Second class postage paid at Sioux Falls, South Dakota 57101 and additional mailing offices. POSTMASTER: Send address changes to SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105.

NATIONAL ADVERTISING: Contact State Medical Journal Advertising Bureau, Inc, 711 South Boulevard, Oak Park, Illinois 60302. Phone: 708-383-8800.

LOCAL AND CLASSIFIED ADS: Contact Jeri Spars, SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Phone: 605-336-1965.

PRINTER: The Ovid Bell Press, Inc, PO Box 370, Fulton, Missouri 65251-0370.

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### About the Cover

*The highway closed because of the new interstate and the railroad closed due to bankruptcy...the town closed because there were no people. Photographer Joel Strasser from his book "Where My Heart Is".*



# South Dakota Foundation for Medical Care

## Getting Ready For The Health Care Quality Improvement Initiative

Health Care Financing Administration (HCFA) is using a new approach to assist the medical community improve care for Medicare patients. In accordance with this new approach, the South Dakota Foundation for Medical Care (SDFMC) will use the process of pattern analysis to interact with physicians and hospitals in South Dakota. This new project will be an educational, nonpunitive effort.

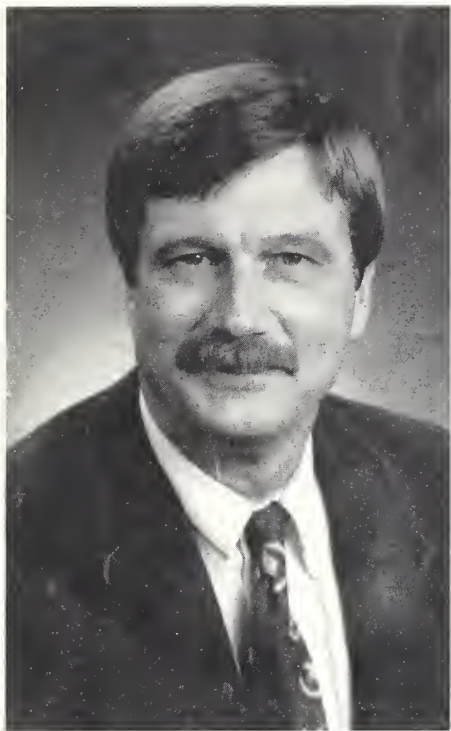
HCFA calls this program – "Health Care Quality Improvement Initiative" (HCQII). The goal of HCQII is to move from dealing with individual case review to a process of helping physicians and hospitals improve the mainstream of care. HCQII is to individual physician review what epidemiology is to clinical medicine. The focus is away from individuals and onto groups – groups of physicians or groups of hospitals. By examining data collected from these groups, SDFMC will use HCQII methods to identify variations in patterns of care or outcome. SDFMC will help hospitals and physicians look at such variations to determine what process of care is most cost-effective and preferred practice.

SDFMC has added new staff positions to carry out this quality improvement effort. As the Principal Clinical Coordinator for the HCQII program, I will be the primary liaison with physicians and hospitals in South Dakota. An assistant clinical coordinator and a statistician will assist in data analysis and contacts with the medical community.

We will use HCFA supplied data to identify significant trends and variations from national or peer group patterns. Once patterns are identified, SDFMC will share the data with hospitals and physicians. This will enable physicians to improve processes of care and outcomes and to monitor progress toward benchmarks when they are available.

I am excited about the possibilities this project presents for the South Dakota Foundation for Medical Care to use outcome management and continuous quality improvement principles in a joint effort with South Dakota physicians and hospitals to improve the quality of care for Medicare beneficiaries.

Bruce Lushbough, MD, MS  
Principal Clinical Coordinator



Thomas L. Krafka, MD, President  
South Dakota State Medical Association

### Health Care Reform

**H**ealth Care Reform—we can't pick up a magazine or newspaper without seeing a headline and article about it. As a member of the Governor's Health Care Commission, and after attending two national AMA sponsored meetings on reform as well as two trips to Washington, I thought I understood what reform would mean for South Dakota. That was before April 19th. Now that we have a new Governor and with President Clinton's programs in trouble in Washington, nothing is certain.

These are a few things I still believe to be true —

- 1) Health Care Reform means Health Care Financing Reform. Most people are satisfied with the care they are receiving but want to pay less and have security of having a third party to pay the bills.
- 2) Our Federal government refuses to admit that it (Medicare and Medicaid) is a significant part of the problem. Underpayment leads to cost shift. Most reports agree that Medicare won't be changed except for funding cuts and Medicaid is ruining the budget of every state.
- 3) One priority is to establish a system to provide a third party payment source for everyone. Defining a "basic benefit package" and how to raise the 40-150

billion to fund universal coverage will provide job security for many lobbyists.

- 4) The second priority is to limit or control overall health care expenditures. No one has defined the appropriate amount (expressed as a percent of GNP). There is also no agreement on what system would control expenditures best and far too little emphasis on the effect on the health care industry (jobs).
- 5) The issue is so complex that it may be unsolvable unless new rules are established; e.g. the Oregon experiment. Even Hilliary Clinton has admitted it is an incredibly complex issue. She has apparently moved beyond blaming doctors, hospitals, insurance and drug company's greed.
- 6) Although it is unlikely there will be a comprehensive reform package this year, Sioux Falls will begin to deal with changes associated with large employers (influenced by Minnesota). Whether change comes from Washington, Minnesota or Pierre, it has become apparent that vertically and horizontally integrated health care delivery networks will be necessary to negotiate with purchasers of health care (large employers, purchasing cooperatives or governmental agencies).
- 7) SDSMA can choose to take a reactive or proactive stance. Because of the disarray in Washington, the change of leadership in Pierre and the rural nature of most of our state, change may not be forced for years. Should we choose to be proactive we are uniquely able to affect such change because of DakotaCare, Blue Shield, the PRO, etc.

This entire situation has presented SDSMA an opportunity to take a leadership role in establishing alliances and networks that will deliver coordinated (managed) care in the future. This will require some sacrifice of the clinical and financial freedoms we now enjoy, but will be compensated for by being able to maintain our professional relationships in a manner to deliver the highest quality care with limited funding.

The other option is to wait or even stall change as long as possible which would allow networks and alliances to be formed without our leadership. Physicians would then eventually be forced to join with little or no influence (as they are in Minnesota). I have no doubt that the integrity of the health care delivery system can be maintained and improved by the SDSMA being proactive. The people of South Dakota will be best served with their physicians in leadership roles rather than leaving change to administrators and bureaucrats.

*Thomas L Krafka MD*





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# Non-Immune Hydrops Associated With Congenital Herpes Simplex Infection

*Denise Greene, MSIV, William J. Watson, MD, Patricia S. Wirtz, MD*

## ABSTRACT

Non-immune hydrops fetalis is a rare pregnancy complication, which can be caused by a myriad of conditions. Etiologies include metabolic or chromosomal disorders, fetal structural anomalies, and fetal infections. We present a case of non-immune hydrops caused by an intra-uterine infection with Type 1 Herpes Simplex Virus. Evaluation of the fetus with non-immune hydrops should include an amniocentesis for viral culture of the amniotic fluid.

Non-immune hydrops fetalis is a pregnancy complication observed in approximately one per three thousand deliveries.<sup>1</sup> It is defined as an excess of extracellular fluid in fetal tissues, in a pregnancy without antibodies against red blood cell antigens detectable in maternal serum. The diagnosis is most commonly made by ultrasound, with visualization of ascites, pleural and pericardial effusions, and skin edema. At least two of these fluid accumulations must be present to make the diagnosis.

Non-immune hydrops can be caused by multiple factors, including fetal structural anomalies, cardiac rhythm disturbances, chromosomal disorders, metabolic abnormalities, and infectious processes.<sup>1,2</sup> In the most comprehensive review published on the subject, approximately 8% of these cases were attributed to maternal-fetal infections.<sup>2</sup> Cytomegalovirus, parvovirus, syphilis and toxoplasmosis are the most commonly identified infectious causes, but other viruses such as respiratory syncytial virus and coxsackie virus have also been implicated.<sup>2</sup> Herpes virus has been reported to our knowledge in only one previous case of non-immune hydrops.<sup>3</sup> We present a case of non-immune hydrops fetalis caused by intrauterine infection with Herpes Virus Type 1.

## CASE REPORT

A 22 year old native American female, gravida 3, para 2-0-0-2 first presented for obstetrical care at 25 weeks gestation, after falling and sustaining mild abdominal trauma. She had no previous medical problems. Both her previous infants were born by

cesarean section at term. She denied fever or symptoms of systemic infection.

Initial sonography showed a fetus with severe hydrops - marked skin edema, pleural effusion, and ascites were present. No fetal anomalies were identified in a careful sonographic survey. Laboratory evaluation showed normal maternal hematologic indices, and a negative antibody screen. A Kleihauer-Betke test showed no fetal cells in the maternal circulation. Parvovirus IgG, but not IgM, antibodies were present. Amniocentesis for fetal karyotype indicated a normal 46, XY result. Viral culture of the amniotic fluid was positive for Herpes Simplex Virus Type 1, confirmed by monoclonal antibody testing.

At 26 weeks gestation, a fetal demise in-utero occurred, and labor was induced. A stillborn male fetus was delivered without any gross external anomalies. Placental pathology showed marked villous edema, but no other gross or microscopic abnormalities.

## DISCUSSION

Im et al<sup>3</sup> reported 20 cases of non-immune hydrops, of which one was associated with a Herpes Type 1 infection, diagnosed by a maternal TORCH titer. The TORCH titer includes serologic studies for toxoplasmosis, rubella, cytomegalovirus and herpes virus IgG and IgM antibodies. No other details on this case were provided in the report. The present case is to our knowledge the first in which Herpes virus was isolated directly from amniotic fluid culture in a fetus with non-immune hydrops.



Evaluation of the fetus with non-immune hydrops is difficult because of the myriad of possible etiologies.<sup>2</sup> Non-invasive tests include determination of maternal blood count and indices (for possible thalassemia), maternal TORCH titer (to evaluate for infectious causes), Kleihauer-Betke test (to look for fetal-maternal hemorrhage as a cause of fetal anemia), and parvovirus titer. In the absence of fetal anemia, parvovirus titers are probably not useful.

Invasive evaluation consists of amniocentesis and fetal blood sampling.<sup>4</sup> Either of these diagnostic modalities may be used to determine fetal karyotype, but only fetal blood sampling can evaluate for fetal anemia. Either amniocentesis or blood sampling can also be used to look for specific metabolic disorders, such as Gaucher's disease, or Tay-Sachs disease.

Although determination of IgM in fetal blood may be useful to evaluate whether an infection is present, this test will often be negative in the presence of documented fetal infection. Amniocentesis for viral culture is mainly used to detect whether cytomegalovirus is present.<sup>4</sup>

As many as 1 in 3 cases of non-immune hydrops has an undetermined etiology. Since the recurrence risk for some conditions may be as high as 25%, a thorough evaluation should be undertaken in every case. In the present case, if the viral culture had not been done, the non-immune hydrops would have been considered

"idiopathic". Since invasive testing for determination of fetal karyotype and hematocrit is already part of the recommended evaluation, obtaining a small sample of amniotic fluid for viral culture does not add any additional risk to the patient, and may provide useful diagnostic information.

---

#### AUTHORS

Denise Greene is in her fourth year of USD School of Medicine, Sioux Falls, SD.

William J. Watson, MD, is at Obstetrics and Gynecology Ltd., Maternal Fetal Medicine, Sioux Falls, SD.

Patricia S. Wirtz, MD, is at Central Plains Clinic, Department of OBG, Sioux Falls, SD.

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# South Dakota Society Of Pathologists



### Is There an Optimal Modern Method for the Diagnosis of Breast Carcinoma?

**B**ecause of the high incidence, significant morbidity and mortality, and emotional impact, the diagnosis of breast carcinoma at a curable stage continues to generate much interest. The widespread use of breast cancer screening by mammography and physical examination have enabled us to diagnose many small tumors (not necessarily "early" tumors) which seem to be associated with a better therapeutic outcome than larger tumors. The multiple breast biopsies resulting from the new screening procedures have allowed intense study of proliferative lesions such as the atypical hyperplasias and intraductal and intralobular carcinomas found on biopsy. The natural history and subsequent management of these processes is in evolution.

The classic approach to a palpable breast mass has been excision and diagnosis often by frozen section with subsequent therapy in one surgical episode. The lack of ability to discuss options with the patient has been considered a serious drawback and excisional biopsy (EB) followed by a second anesthesia, if necessary, for definite therapy of a malignant lesion has been criticized as increasing patient morbidity and not being cost effective.

Alternative methods to EB include fine needle aspiration biopsy (FNA) and core needle biopsy (CNB) the latter often directed by sophisticated stereotactic techniques. One could argue cost effectiveness as well as sensitivity (measure of number of false negative results) and specificity (measure of false positive results) for each, but clearly excision biopsy will be the gold standard.

Let us discuss the problem of false negative results first. EB is the most definitive and I still believe is the procedure of choice for patients with a palpable mass who are high risk or postmenopausal after an initial attempt at cyst aspiration. However, what about mammographic abnormalities, residual solid masses after aspiration or women with multiple abnormalities in one or both breasts? FNA and CNB both have advocates. One recommendation is the triple diagnosis strategy employing physical examination, mammography and FNA or possible CNB. If all three mammography, physical examination and FNA or CNB are negative, no EB is done.

If the palpable mass or nonpalpable abnormality is not excised even if the triple diagnosis strategy is employed, I believe follow-up with repeat procedures

used in the triple diagnosis approach must be employed as clinically indicated. Some percentage of false negative will occur. I do not believe one should be hesitant to perform EB at any time if indicated. In our medical legal climate false negatives are not acceptable.

Regardless, it would appear that some false positives are bound to occur. For this reason, I believe a biopsy and histologic diagnosis is mandatory before major surgery whether modified radical mastectomy or local wide excision and subsequent radiation are contemplated. This may be accomplished by frozen section of a definite mass. However, if the mass is small (less than 1 cm) or there is no definite mass, I feel careful histologic examination by multiple permanent sections is preferable. Proceeding to definitive therapy before such careful histologic assessment is not in the best interests of the patient and courts disaster.

Lastly, if the palpable mass or nonpalpable abnormality is not removed what about the hyperplastic lesions typical or atypical? How can these be evaluated? Will an atypical hyperplasia progress to an invasive lesion? As knowledge of proliferative breast lesions is still in flux, failure to biopsy these lesions could deprive us an opportunity to properly evaluate such lesions.

John F. Barlow, MD  
Editor

---

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## Correspondence

Dear Dr Freeman:

I appreciated your editorial, "Thoughtful Restraint" in the February issue of the Journal. You raised concerns about restraint related morbidity, legal liability, and ethical concerns. To these concerns could be added risk of mortality directly related to restraints and questions regarding efficacy.

Powell et al, in the September 15, 1989 edition of the Canadian Medical Association Journal, reported experiences in Winnipeg where restraint use was decreased from 52 per 1000 patient days to 0.3 per 1000 patient days without dramatic changes in either the total number of falls or the number of falls producing injuries.

A review article in a 1989 issue of the Journal of the American Geriatric Society notes prevalent rates for restraint use varying between 6 to 86% and little demonstration of efficacy of restraints for safeguarding patients from injury.

The legal issues are troublesome but cannot entirely dictate behavior, lawsuits have been brought for both the use and non-use of restraints.

All of us in medicine (and also, as you point out, in nursing) need to remain vigilant in efforts to prevent falls and injuries to our patients while at the same time recognizing that restraints are often not a helpful intervention.

D. A. Brechtelsbauer, MD  
Associate Director  
Family Practice Center, Inc.  
Sioux Falls, SD

Dear Dr Barlow:

I read with interest your editorial in the May, 1993 issue of the Journal.

The comparison of modern day medical providers to ancient messengers is interesting. Perhaps we might consider that the modern provider/messenger wasn't killed because he bore bad news but actually committed suicide to overindulgence along the way. In all honesty the only increase in medical cost that you mention is the increasing demand for services must be controlled but we also must look at such factors as expensive technology, over utilization, tort reform, paper work, insurance and consumer practices.

I think that all participants in the health care system will be required to make sacrifices and I would be hopeful that the providers will participate in looking at the overall system analysis.

I think that after 25 years of watching the system slowly deteriorate and failing to accomplish meaningful reform it is inappropriate for us to demand the leadership role in the current crisis.

I would agree with your assessment that the medical industry is an extremely important part of the overall economic picture, however it is not a non-polluting service and some portions of it are certainly non-essential.

I'm sure we agree in many more areas than we disagree and I've always enjoyed your time and dedication to medicine. We still miss you in Sioux Falls.

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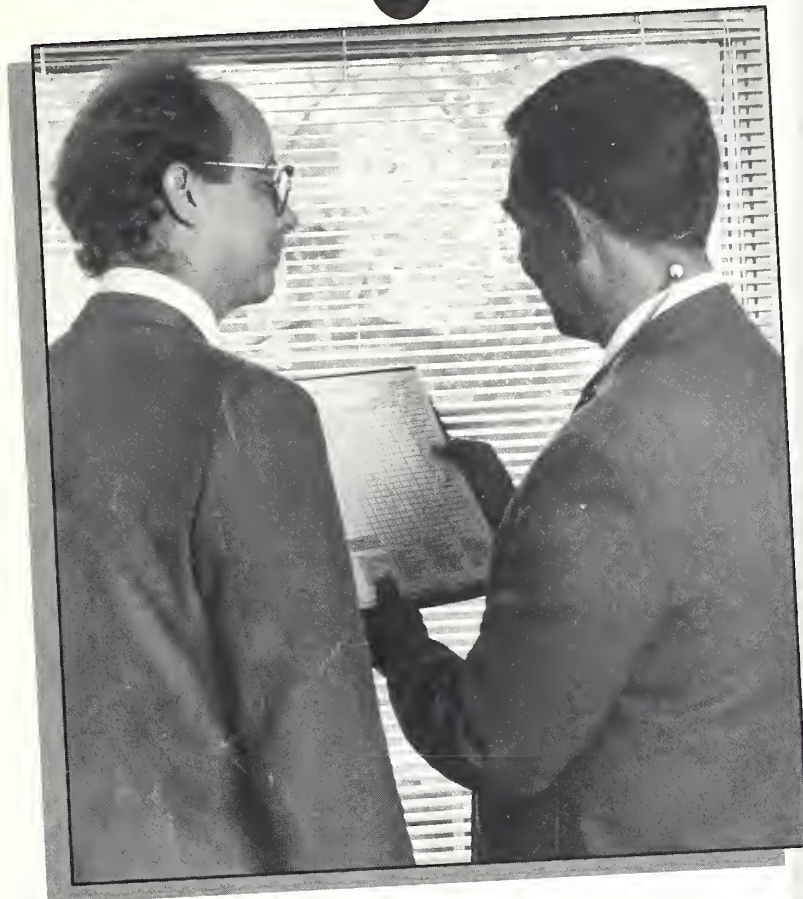
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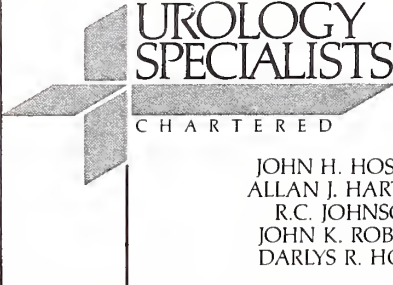
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**Patti Herlihy, President, South Dakota  
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**T**he American Medical Association Alliance can truly boast of a multitude of accomplishments! This organization is a "doer", and this next year promises to be no exception.

Each and every person is valuable for his/her own self, focusing on the importance of the individual will be my main theme. Even though we must operate collectively and remain unified to be effective, we need to express our own opinions and be recognized for our own contributions. In turn, for the AMA Alliance to reach its full potential as an influential force, it needs the membership of each and every spouse. We are each encouraged to work for 1 (or more than one) new federated member at the state level. The "Every Member Get a Member" campaign will be premiering in Facets in 1993 as a national effort. According to Carol Phillips, Chairman of the 1993-94 Membership Development Committee, we are off to a "one-derful" beginning in building a federation for the future, one member at a time.

Raising funds for the American Medical Association Education and Research Foundation (AMA-ERF) is always of top priority. These monies are critical for our medical schools and medical education and none of us can over-emphasize how much our help is needed and appreciated. The new national goal is to ask each

member to buy one or more hours of medical education at \$21.03 per hour.

Again this year, The Campaign Against Family Violence will be emphasized by the Health Promotion Committee. I encourage increased development and support of violence education and prevention programs in South Dakota. Adolescent health is another area of concern where more involvement is necessary. The needs of adolescents are multiplying as our society becomes more and more complex. We are in an ideal position to become the instigators developing programs to help this age group. In addition, the National Health Promotion Committee is urging every state and district to identify and address the needs of their own communities.

All of us are greatly concerned about the national health system reforms. There is no better way to ensure that our voice is heard than to be active in legislative affairs. There is no more critical time to present a unified voice within the medical community than now. The impact that we could have on our own state's legislature cannot be understated. We all must take an active role. We must accept this challenge immediately, and take up the cry of the AMAA's Legislative Affairs Committee: "One Choice-One Voice".

Finally, so many of our doctors and their spouses continue to make invaluable contributions in all areas of their respective communities. A special effort needs to be made to contact members of the media so they can help spread this good news. Too often we are not given credit for so many of our efforts; it is time to acknowledge these accomplishments and thus further enhance the image of medicine.

Alliance members from more populated states are amazed when they learn what we have accomplished here in South Dakota. I look forward to working towards these goals with our talented South Dakota Alliance members. I cannot help but feel proud to be a part!

*Patti Herlihy*



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# Statewide Lung Cancer Study

## South Dakota Tumor Registrars' Association

Michael O. Robinson, MD, Karla Sorenson, ART, CTR

The South Dakota Tumor Registrars' Association recently collected data on 361 patients with 363 sites of lung cancer diagnosed in South Dakota in 1989. The following hospitals participated in this study: St. Luke's Midland Hospital, Aberdeen, SD; Brookings Hospital, Brookings, SD; Air Force Hospital SGARC, Ellsworth, SD; Rapid City Regional Hospital, Rapid City, SD; McKennan Hospital, Royal C. Johnson's Veterans Memorial Hospital, and Sioux Valley Hospital all of Sioux Falls, SD; Prairie Lakes Hospital, Watertown, SD; and Sacred Heart Hospital, Yankton, SD. The purpose of this study was to establish a baseline for the diagnosis and treatment of lung cancer in South Dakota.

There were 361 patients - 250 male and 111 female. Two hundred eighty-five patients lived in South Dakota, 37 in Minnesota, 27 in Iowa and 6 in Nebraska. Eighty-eight percent of the men were ages 50 to 80 and 83% of the women were age 50 to 80. (Table I) Nearly 95% were white and 3.3% were American Indian. Eighty-seven percent of the patients smoked. The amount of tobacco consumption varied widely but most smoked

more than one pack per day and had a greater than 15 pack/year usage. Twenty-eight percent of the patients were retired and 14% were involved in farming and ranching. The previous occupation of the retirees was not known. A small number of patients (7) admitted to prior asbestos exposure, but 96% of the patients denied, or did not know of, any exposure.

Over three-fourths of the patients presented with symptoms (usually an ominous predictor of outcome). Eighteen percent of the patients had cancer detected by a physical examination or a routine chest x-ray. The most common

| Table II<br>Symptoms at Presentation |     |
|--------------------------------------|-----|
| Cough                                | 136 |
| SOB                                  | 113 |
| Wt Loss                              | 82  |
| Chest Pain                           | 68  |
| Hemoptysis                           | 47  |
| Fatigue                              | 29  |
| Hoarseness                           | 15  |
| Weakness                             | 9   |
| Back Pain                            | 9   |
| Other                                | 145 |

symptoms at presentation were cough, dyspnea, weight loss, chest pain, hemoptysis, fatigue and hoarseness. (Table II) Nearly three-fourths of the patients had a chest x-ray, bronchoscopy and /or CAT scans of the chest. Less than 40% of the patients had CAT scans of the brain, bone scanning or sputum cytology performed. A number of different biopsies were performed including bronchial washings (48%), bronchial biopsy or brushings (31%), percutaneous needle biopsy (18%) and transbronchial biopsy (12%). Fewer numbers of patients had transbronchial needle biopsies, mediastinoscopies or other needle biopsies via bronchoscopy.

Table I  
Age Distribution

| Age Range | Male |        | Female |        |
|-----------|------|--------|--------|--------|
| 0-30      | -    | -      | 2      | 1.8%   |
| 31-40     | 3    | 1.2%   | 1      | 0.9%   |
| 41-50     | 6    | 2.4%   | 6      | 5.4%   |
| 51-60     | 39   | 15.6%  | 20     | 18.0%  |
| 61-70     | 102  | 40.8%  | 38     | 34.2%  |
| 71-80     | 78   | 31.2%  | 34     | 30.6%  |
| 81-90     | 20   | 8.0%   | 8      | 7.2%   |
| 91+       | 2    | 0.8%   | 2      | 1.8%   |
| Total     | 250  | 100.0% | 111    | 100.0% |



Nearly one-half of the cancers were found in the upper lobes with one-fifth of the cancers described in the lower lobes. The histology of the diagnosed lung cancers were almost evenly split between squamous, small cell, large cell and adenocarcinoma. (Table III) Tumor size was not stated in 36% of the patients but was larger than 3.1 cm in 43% of the patients.

**Table III**  
Histology

|                         |     |        |
|-------------------------|-----|--------|
| Squamous Cell Carcinoma | 86  | 23.7%  |
| Small Cell Carcinoma    | 86  | 23.7%  |
| Large Cell Carcinoma    | 85  | 23.4%  |
| Adenocarcinoma          | 77  | 21.2%  |
| All Other               | 29  | 8.0%   |
| Total                   | 363 | 100.0% |

**Table IV**  
AJCC Staging

|                    |     |        |
|--------------------|-----|--------|
| Stage O            | -   | -      |
| Stage I            | 77  | 21.2%  |
| Stage II           | 22  | 6.1%   |
| Stage IIIA         | 62  | 17.1%  |
| State IIIB         | 43  | 11.8%  |
| Stage IV           | 134 | 36.9%  |
| Unknown/Not Staged | 25  | 6.9%   |
| Total              | 363 | 100.0% |

Patients were staged both by Surveillance Epidemiology and End Results Reporting (SEER) and American Joint Committee on Cancer (AJCC) staging. Fifty-two percent of the patients had locoregional disease and 42% had distant disease (6% unknown) by SEER staging. AJCC staging showed 27% Stage I and II (likely resectable) and 49% Stage IIIB and IV (unresectable or metastatic). (Table IV) Distant sites of spread seen most commonly included: bone, liver, brain, contralateral lung and pleura.

Various types of surgical procedures were employed. Seventeen percent of the patients had a lobectomy with or without lymph node dissection, 3% had a pneumonectomy and 32% had a biopsy of primary site only. No surgery (or none reported) was done in 23% of the patients(perhaps the small cell cohort). (Table V)

Fifty-three percent of patients had treatment that included radiation therapy. Common sites treated included the lung  $\pm$  mediastinum  $\pm$  neck nodes in 63% of the patients; and brain  $\pm$  lung in 19%. Chemotherapy was used in 37.2% of patients, presumably for patients with small cell carcinoma and select patients with metastatic non-small cell cancer,

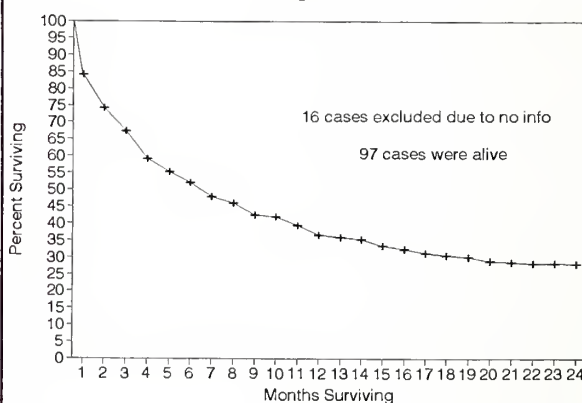
**Table V**  
Surgical Procedures

|                                |    |       |
|--------------------------------|----|-------|
| Local Excision                 | 2  | 0.5%  |
| Wedge Resection                | 5  | 1.4%  |
| Lobectomy W/O LN Diss.         | 17 | 4.7%  |
| Lobectomy W LN Diss.           | 43 | 11.8% |
| Pneumonectomy                  | 9  | 2.5%  |
| Rad. Pneumonect W Mediast LN   | 2  | 0.5%  |
| Surgery at Distant Site        | 3  | 0.8%  |
| Surgery, NOS                   | 2  | 0.5%  |
| Surgery Not Done or Not Stated | 82 | 22.6% |

and in conjunction with radiation therapy for patients with locoregional disease. Immunotherapy was not used in any patient. Pleurodesis was performed in 2 patients. Twenty seven patients (7%) were treated on national research protocols.

At the time of this report, 97 patients were living but 41 of these patients have evidence of cancer (presumably some of these will not survive). The majority of deaths occurred within the first year (213). One hundred sixty-two patients died in the first 6 months. A few patients died without cancer and a few patients were alive with the cancer status unknown. (Table VI)

**Table VI**  
Lung Survival



## DISCUSSION

This study confirms national data concerning lung cancer. Unfortunately, the majority of patients present with symptoms and, subsequently, advanced stage of disease. Only one-fourth of the patients had Stage I or II disease. Most patients therefore, were not surgical candidates, and this was reflected in the dismal survival figures. Since trials evaluating screening for lung cancer have not shown a survival benefit,<sup>1-3</sup> the only rational approach for the future seems to be education (to stop smoking) and/or better treatment options.

## ACKNOWLEDGEMENT

Special thanks to the following tumor registrars for their extra efforts towards collecting and compiling the data for this study: Vicki Roelofsen, Brookings Hospital; Alice Mullner, St. Luke's Midland Regional Medical Center; Carolyn Purdy, CTR, US Air force Hospital SGARC; Cathy Swaney and Karen Elverud, Rapid City Regional Hospital; Kara LeBrun, RRA and Norma Wise, CTR, McKennan Hospital; Deb Blom, Royal C. Johnson Veterans' Administration Hospital; Diane Martian, ART, Prairie Lakes Hospital; Sue Berke, Sacred Heart Hospital; Roma Larson, ART, Vicki Carsrud, ART, and Karla Sorenson, ART, CTR, Sioux Valley Hospital.

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### Drug Therapy for Hyperlipidemia

*Dennis Hedge, Pharm.D, Sioux Falls, SD*

When dietary modifications and other nonpharmacologic measures such as exercise and smoking cessation fail to produce desired changes in a patient's lipid profile, a clinician is then faced with the question "Which drug should I select for my patient?". Several different types of agents are available including the bile acid sequestrants (cholestyramine and colestipol), niacin, gemfibrozil, probucol, and HMG-CoA reductase inhibitors (lovastatin, simvastatin and pravastatin). The selection of the appropriate drug depends on the type of lipid disorder that the patient has as well as his ability to tolerate and comply with the drug regimen prescribed.

The bile-acid sequestrants lower total and LDL cholesterol levels. These agents bind bile acids in the intestine interrupting the recycling of bile acids through enterohepatic circulation. This results in the conversion of cholesterol to bile acids and the subsequent increase in activity of LDL receptors in the liver which increases the hepatic uptake of LDL cholesterol.

Adverse effects and the need for frequent dosing make compliance with a bile-acid sequestrant regimen difficult. The adverse effects are primarily limited to the gastrointestinal tract including constipation, flatulence, fullness, abdominal pain, and nausea. Also, because these agents may increase triglycerides due to an increase in VLDL, they are not recommended for patients with significantly elevated triglycerides. In addition, these agents reduce absorption of several drugs including warfarin, digoxin, thiazides, and thyroid supplements, as well as the fat soluble vitamins A, D, E, and K.

Niacin reduces the hepatic synthesis of VLDL which results in decreased levels of triglycerides, total serum cholesterol and LDL cholesterol. Niacin also increases the level of HDL cholesterol. These ideal changes on the lipid profile, in addition to the low cost of the medication, make niacin an attractive agent for treating hyperlipidemia. However, many patients are unable to tolerate therapy with this agent because of flushing, pruritis and headache which are probably related to prostaglandin mediated vasodilation. Administering aspirin or other prostaglandin inhibitors 30 minutes prior to each niacin dose may reduce the associated flushing, pruritis and headache. Niacin can also cause glucose intolerance, hyperuricemia which may precipitate gout, and hepatotoxicity, particularly with sustained-release products.<sup>1</sup>

Gemfibrozil is a fibric acid derivative which lowers plasma triglycerides and VLDL and increases HDL cholesterol by increasing lipoprotein lipase activity. Stimulation of lipoprotein lipase reduces triglycerides by increasing the catabolism of VLDL. In patients with high total cholesterol and normal triglycerides, gemfibrozil reduces LDL by 10% to 15%.<sup>2</sup> In patients with elevated cholesterol and triglycerides, LDL is reduced by about 5%. Finally, in patients who have high triglyceride levels only, LDL cholesterol may be slightly increased.

Gemfibrozil is generally well tolerated. Adverse effects include gastrointestinal disturbances, cholelithiasis, rash, muscle pain and elevations of liver function tests. It is also important to note that gemfibrozil may increase the hypoprothrombin effects of warfarin.

Probucol increases the catabolism of LDL cholesterol and generally lowers total cholesterol and LDL cholesterol by 10% to 20% in patients who respond. It also decreases HDL cholesterol by 20% to 30% and has no effect on triglycerides.

Adverse effects of probucol include nausea, diarrhea, headache, dizziness, neuritis, and weight loss. Probucol may also increase the QT interval of the EKG and should be avoided in patients with underlying cardiac disease and in patients taking other drugs which are known to prolong the Q-T interval.

The HMG-CoA reductase inhibitors are the most potent agents available for lowering LDL cholesterol levels, yielding reductions of approximately 20%-40%.<sup>3-5</sup> They also modestly increase HDL cholesterol and modestly decrease triglycerides. These drugs inhibit the enzyme that catalyzes the rate-limiting step in cholesterol synthesis. This lowered intracellular cholesterol stimulates the synthesis of LDL receptors which enhances the intracellular uptake of plasma LDL resulting in a lowered total cholesterol and LDL cholesterol.

The most common adverse effects of HMG-CoA reductase inhibitors include headache and gastrointestinal upset. Rare but serious adverse effects include increased liver function tests and myopathy with elevations of creatine phosphokinase (CPK), especially when these agents are given with cyclosporine, gemfibrozil, niacin and erythromycin.

Combination drug therapy should be considered when LDL is not reduced to the minimum goal with maximal single drug therapy. Bile-acid sequestrants with niacin and bile-acid sequestrants with the HMG-CoA reductase inhibitor lovastatin have been shown to be very effective in reducing LDL cholesterol. An

HMG-CoA reductase inhibitor and niacin or gemfibrozil enhances LDL reductions and adds greater triglyceride lowering and HDL raising effects;<sup>6</sup> however, these combinations may be associated with an increased incidence of myositis or myopathy and should be used with extreme caution when no other options are available.

For most patients, hypercholesterolemia can be effectively managed by selecting an appropriate drug. However, several issues must first be considered before drug therapy is initiated. Adequate dietary modification must first be tried before drug therapy is considered.<sup>7</sup> Dietary therapy is often sufficient to treat mild to moderate elevations in cholesterol and obviously avoids the adverse effects of lipid lowering drugs. When drug therapy becomes a necessity, a clinician has several viable alternatives from which he may choose. An individualized approach to therapy is a necessity as drug therapy will be maintained for the long-term. Total cholesterol levels, LDL and HDL levels, CHD risk factors and the patient's ability to tolerate and comply with the prescribed regimen must all be considered. When these factors are considered, the answer to the question "Which drug should I select for my patient?" should become much clearer.

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Edited by Brian Kaatz, Pharm.D.



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August 1993  
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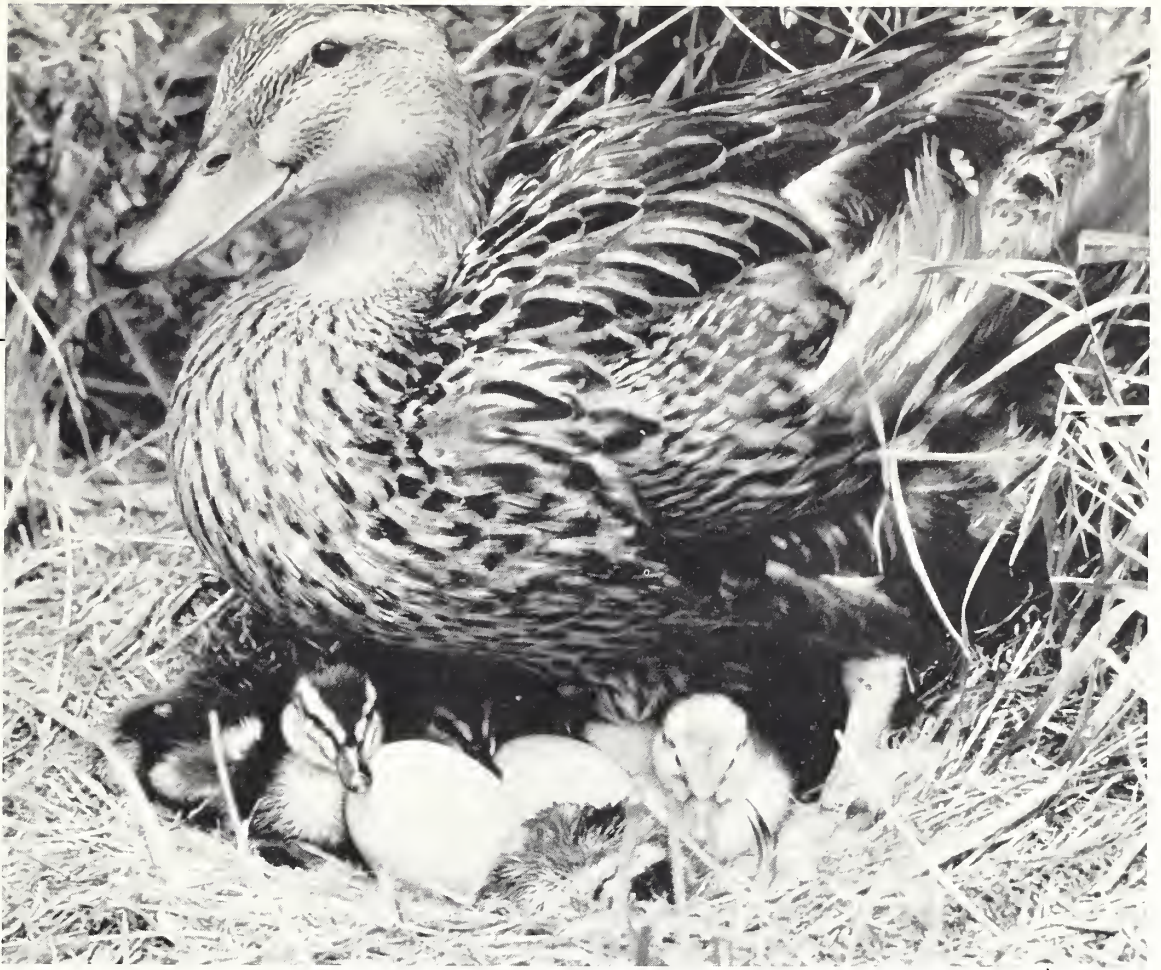
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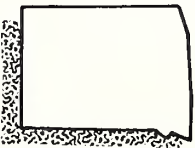
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# SOUTH DAKOTA JOURNAL OF MEDICINE

Volume 46/No. 8 August 1993

(ISSN 0038-3317)

Official Publication of the  
South Dakota State Medical Association  
the South Dakota Chapter of the  
American College of Surgeons  
the South Dakota Psychiatric Association  
of the American Psychiatric Association

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SOUTH DAKOTA JOURNAL OF MEDICINE (ISSN 0038-3317) is published monthly by the South Dakota State Medical Association, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Subscription price: \$15 per year domestic, \$18 per year foreign, \$1.75 for single copy. Second class postage paid at Sioux Falls, South Dakota 57101 and additional mailing offices. POSTMASTER: Send address changes to SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105.

NATIONAL ADVERTISING: Contact State Medical Journal Advertising Bureau, Inc, 711 South Boulevard, Oak Park, Illinois 60302. Phone: 708-383-8800.

LOCAL AND CLASSIFIED ADS: Contact Jeri Spars, SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Phone: 605-336-1965.

PRINTER: The Ovid Bell Press, Inc, PO Box 370, Fulton, Missouri 65251-0370.

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## NEXT MONTH

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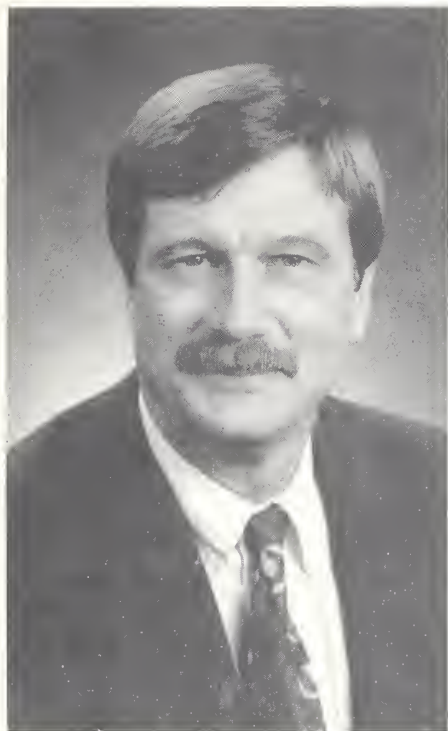


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**Thomas L. Krafka, MD, President  
South Dakota State Medical Association**

I am finally, officially President of SDSMA. Reciting the Oath of Office in front of the House of Delegates is a sobering experience. I now have a better idea of what my predecessors meant when they talked about the honor of being president.

My first official act (within hours after the oath) was to go to the AMA annual meeting in Chicago, where I was again honored by being on stage and being introduced with the other state presidents during Dr Painter's inauguration as AMA president.

After attending the AMA annual meeting (my first), I think everyone who has ever said "the AMA doesn't represent me" doesn't understand the AMA. There is, of course, politics as candidates run for office, but although it may be distasteful to some, it is necessary to select the best people to represent physicians to the media, the government and the public.

The real work of the AMA is done in multiple reference committees where hundreds of resolutions from states, groups and individuals are considered for adoption, study, action or to be trashed. These resolutions cover topics from important to ridiculous, but each of you could find one or more issues to identify with. From all of these resolutions the House of Delegates determines the policies and direction of the AMA.

I have heard many excuses for not joining the AMA, most from individuals who have no idea how the AMA works or what it stands for. Many believe that their specialty societies represent them and their interests better than the AMA does. I have no doubt that this is true for economic and turf concerns, but when the issue is how medical care will be delivered and how the public's medical needs will best be met, only an organization that crosses specialty lines and speaks for all physicians can successfully represent us.

If the primary goal is the well being of a single specialty or type of practice the AMA does not have the answer, but if you believe that you and other physicians should be the ones to influence public opinion and law on subjects ranging from inspection of oysters to health care reform, I urge you to join the AMA and become active in the SDSMA so the South Dakota delegates can convey your wishes to the AMA.

If we as physicians are going to have significant influence we must be united and not a number of individual organizations "making deals" for their advantage.

As you may have gathered from the above editorial, I was favorably impressed by my trip to Chicago. The way the AMA develops policies and the dedication of the physicians doing the work should be seen and experienced by all physicians. Since that's not possible those of us who have had the opportunity need to be better messengers. Get the message?

*Thomas L Krafka MD*



### Memory, Transient Global Amnesia, and History Taking

Memory is the measure of who we are as individuals and as a collective people. The loss of memory is a terrifying prospect, a disruption of the very self, as witnessed by the person suffering from the ravages of Alzheimer's disease.

Certainly the ancients placed great value on memory. Mnemosyne (which means memory) was one of the Titans or "elder gods" who reigned supreme over the universe until Zeus overthrew his father and ascended to power.<sup>1</sup> Mnemosyne and Zeus gave birth to the nine Muses who "brought to humanity the purifying power of music, the inspiration of poetry and the wisdom needed also by others who were not poets..."<sup>2</sup>

Occasionally, a patient and family get a transitory glimpse of the chaos wrought by memory loss, and then a reprieve. Transient global amnesia (TGA) can provide such a temporary upheaval. Recently, I saw two patients in a single evening with this unusual condition, prompting this brief clinical review of their stories.

The first patient was a 67 year old who, in mid-afternoon, was noted to make some mildly inappropriate comments and to have difficulty helping with repair work on a combine. Then, in a cafe, he was noted to be confused, and, after he left, it took him twenty five minutes to drive six miles home. His wife observed him to be bewildered and confused. He observed, "I don't know you," and asked, "Where am I?" He also repeatedly stated, "I don't know where I've been" and "What did I do?" During this time his speech was fluent and his gait and dexterity were observed to be normal. The family noted that he had had a prior episode of amnesia, lasting about one hour, several years earlier. His current episode lasted about six hours. His workup (including MRI of the head, EEG and carotid duplex scanning) was negative.

The second patient was a 63 year old male who was noted by his wife to seem bewildered during an evening walk. On returning home, he looked in a closet in a confused fashion and began to repeatedly ask questions. He had no difficulty with articulation of speech or motor function. In the emergency room, several hours after the symptoms began, he repeatedly asked where he was and why he was there. He became somewhat agitated when an attempt was made to do a CAT scan. This scan and an EEG were normal. A carotid duplex scan and MRI angiogram of the carotids suggested a moderate stenosis of the left carotid.

The diagnosis of TGA can only be made with confidence when an appropriate history is available from first-hand observers of the patient. The patient remains completely amnesic for the episode and is

unable to provide any meaningful account of his or her behavior during the spell. Ordinarily, diagnostic testing does not reveal a definitive cause for the episode, although there is an increased incidence of hypertension, atherosclerotic vascular disease and diabetes mellitus.<sup>3</sup>

Because the effective diagnosis of this syndrome is so dependent on successful history taking, it can serve as a paradigm clinical example of the fundamental importance of obtaining the patient's narrative or story, even in this current age of emphasis on high technology for diagnosis and treatment. Such paradigms are needed. While lip service is still widely given to the importance of thorough history taking, there seems to be considerable danger that practicing physicians and residents in training can become overly enamored with costly testing. We physicians can underutilize basic communication with the patient and family, even though data suggests that most diagnoses are still made from the medical history.<sup>4</sup>

On a spectrum of "good" or "bad" disease entities, TGA has a number of characteristics which establish it as one of the best of the good. It causes dramatic and frightful symptoms which quickly bring the patient to medical attention; the diagnosis can be confidently and reliably made by the astute physician after the history and physical alone; and the patient invariably gets better. The ending is a happy one. But for the patient an amnesic gap will always remain. He or she may vaguely understand that they teetered on the brink, in sight of the devastating blow that loss of memory can deal to the individual. And then, it might seem, Mnemosyne relents and chooses to restore the individual to wholeness. Except, of course, there remains the patient's nagging scar from once having been shown that personhood can be as fragile as it is enduring.

Jerome W. Freeman, MD  
Editor

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2. Grant, M. *Myths of the Greeks and Romans*. Mentor Books (p 92), 1962.
3. Freeman, JW, Gutnik, LM: Transient global amnesia. *Bruit* 1986;10:88-89.
4. Peterson, MC, et al: Contributions of the history, physical examination and laboratory investigation in making medical diagnoses. *West J of Med* 1992;156:163-165.

# Transactions Of The

## South Dakota State Medical Association

### 112th Annual Meeting

### June 10-12, 1993

#### 1993-1994 OFFICERS

##### President

Thomas L. Krafka, MD ..... Rapid City

##### President-Elect

James Reynolds, MD ..... Sioux Falls

##### Vice President

Mary Carpenter, MD ..... Winner

##### Secretary-Treasurer (1994)

Rodney Parry, MD ..... Sioux Falls

##### AMA Delegate (1994)

Robert L. Ferrell, MD ..... Rapid City

##### AMA Alternate Delegate (1994)

Michael Pekas, MD ..... Sioux Falls

##### Chairman of the Council

James Engelbrecht, MD ..... Rapid City

##### Speaker of the House of Delegates

Stephan Schroeder, MD, ..... Miller

##### Councilor at Large

M. George Thompson, DO ..... Watertown

#### COUNCILORS

##### First District (Aberdeen)

Winston Odland, MD (1995) ..... Aberdeen

James Hovland, MD (1996) ..... Aberdeen

##### Second District (Watertown)

James Larson, MD (1995) ..... Watertown

Stephen Gehring, MD (1996) ..... Watertown

##### Third District (Brookings-Madison)

Curtis Wait, MD (1996) ..... Brookings

Richard Holm, MD (1995) ..... Brookings

##### Fourth District (Pierre)

Phillip Hoffsten, MD (1995) ..... Pierre

Thomas Huber, MD (1996) ..... Pierre

##### Fifth District (Huron)

Curtis Buchholz, MD (1996) ..... Huron

Howard Saylor, MD (1995) ..... Huron

##### Sixth District (Mitchell)

Walter Baas, MD (1996) ..... Mitchell

Lucio Margallo, MD (1994) ..... Mitchell

##### Seventh District (Sioux Falls)

Jeffrey Hagen, MD (1996) ..... Sioux Falls

K. Gene Koob, MD (1995) ..... Sioux Falls

Rodney Parry, MD (1995) ..... Sioux Falls

Guy Tam, MD (1994) ..... Sioux Falls

Lowell Hyland, MD (1996) ..... Sioux Falls

C. Roger Stoltz, MD (1994) ..... Sioux Falls

Robert Raszkowski, MD (1995) ..... Sioux Falls

Daniel Kennelly, MD (1996) ..... Sioux Falls

##### Eighth District (Yankton)

Larry Meyer, MD (1994) ..... Yankton

Bruce Mannes, MD (1995) ..... Yankton

##### Ninth District (Black Hills)

James Engelbrecht, MD (1995) ..... Rapid City

Carol Zielike, MD (1996) ..... Rapid City

J. Geoffrey Slingsby, MD (1994) ..... Rapid City

Stephen Haas, MD (1995) ..... Rapid City

Richard Renka, MD (1994) ..... Rapid City

##### Tenth District (Rosebud)

Richard Kafka, MD (1994) ..... Gregory

Gregg Tobin, MD (1996) ..... Winner

##### Eleventh District (Northwest)

James D. Collins, MD (1994) ..... Mobridge

Ben Henderson, DO (1996) ..... Mobridge

##### Twelfth District (Whetstone Valley)

Kevin Bjordahl, MD (1994) ..... Webster

Alan Bloom, MD (1996) ..... Webster

#### ALTERNATE COUNCILORS

##### First District (Aberdeen)

(1995)

Reid Holkesvik, MD (1996) ..... Aberdeen

##### Second District (Watertown)

Ken Peterson, MD (1995) ..... Watertown

Ken Johnson, MD (1993) ..... Watertown

##### Third District (Brookings-Madison)

Richard Sample, MD (1996) ..... Madison

Tad Jacobs, DO (1995) ..... Flandreau

##### Fourth District (Pierre)

Noel Chicoine, MD (1996) ..... Pierre

Ken Bartholomew, MD (1995) ..... Pierre

##### Fifth District (Huron)

Jeffrey Hanson, MD (1996) ..... Huron

Jeffrey Wheeler, MD (1995) ..... Huron

##### Sixth District (Mitchell)

(1996)

James Gaede, MD (1994) ..... Mitchell

##### Seventh District (Sioux Falls)

Daniel Blue, MD (1996) ..... Sioux Falls

Loren Tschetter, MD (1995) ..... Sioux Falls

(1995)

Robert VanDemark Jr, MD (1996) ..... Sioux Falls

Lawrence Finney, MD (1994) ..... Sioux Falls

(1994)

(1995)

John Sall, MD (1996) ..... Sioux Falls



#### **Eighth District (Yankton)**

Julie Stevens, MD (1995) ..... Vermillion  
Robert Thompson, MD (1994) ..... Yankton

#### **Ninth District (Black Hills)**

Dave Johnson, MD (1994) ..... Rapid City  
Craig Hansen, MD (1995) ..... Rapid City  
Robert Goodhope, MD (1995) ..... Sturgis  
Charles Hart, MD (1994) ..... Rapid City  
John Barlow, MD (1996) ..... Rapid City

#### **Tenth District (Rosebud)**

R. G. Nemer, MD (1994) ..... Gregory  
(1996)

#### **Eleventh District (Northwest)**

(1994)

(1996)

#### **Twelfth District (Whetstone Valley)**

(1994)

Joseph Kass, MD (1996) ..... Rosholt

### **1993-1994 COMMISSIONS**

#### **COMMISSION ON LEGISLATION AND GOVERNMENTAL RELATIONS**

John Barlow, MD (1994) Rapid City, Chairman  
Gary Bruning, DO (1996) Flandreau  
Scott Eccarius, MD (1996) Rapid City  
Catherine Gerrish, MD (1996) Watertown  
James Hovland, MD (1996) Aberdeen  
John Sall, MD (1994) Sioux Falls  
Laura Larsen, MD (1994) Sioux Falls  
James Wiggs, MD (1994) Yankton  
Craig Uthe, MD (1996) Sioux Falls  
Patricia Malters, MD (1994) Mitchell  
O. Myron Jerde, MD (1995) Rapid City  
Vance Thompson, MD (1995) Sioux Falls  
J. Michael McMillin, MD (1995) Sioux Falls  
Steven Feeney, MD (1995) Watertown  
Thomas Olson, MD (1995) Vermillion  
Carmen Chavier, Auxiliary  
Chuck Rose, Clinic Manager

#### **COMMISSION ON INTERNAL AFFAIRS, COMMUNICATIONS AND LIAISON**

Ken Peterson, MD (1994) Watertown, Chairman  
John Jones, MD (1996) Chamberlain  
Martin Christensen, MD (1996) Mitchell  
Brent Lindbloom, DO (1996) Pierre  
(1995)  
Herb Saloum, MD (1996) Tyndall  
Anthony Salem, MD (1994) Sioux Falls  
Dennis Stevens, MD (1994) Sioux Falls  
Dan Heinemann, MD (1994) Canton  
Julie Stevens, MD (1994) Vermillion  
John Griffin, MD (1995) Sioux Falls  
John Davis, MD (1995) Sioux Falls  
Milton Mutch, MD (1995) Sioux Falls  
Paul Bormes, MD (1996) Rapid City  
Brian Tjarks, MD (1995) Mitchell

#### **COMMISSION ON MEDICAL SERVICE**

Robert Harms, MD (1994) Sioux Falls, Chairman  
Thomas Hermann, Jr, MD (1996) Sturgis  
Bernard Linn, MD (1996) Pierre  
Cynthia Weaver, MD (1996) Rapid City  
Henry Travers, MD (1996) Sioux Falls  
David Jenny, MD (1996) Yankton  
Jerome Bentz, MD (1994) Platte  
Richard Sample, MD (1994) Madison  
Jeffrey Hanson, MD (1994) Huron  
Ed Gerrish, MD (1994) Watertown  
Timothy O'Shea, MD (1995) Sioux Falls  
Tad Jacobs, DO (1995) Flandreau  
Robert Suurmeyer, MD (1995) Aberdeen  
Thomas Estes, MD (1995) Sioux Falls  
R. Maclean Smith, MD (1995) Sioux Falls

#### **COMMISSION ON SCIENTIFIC MEDICINE**

Edward Zawada, MD (1994) Sioux Falls, Chairman  
Roger Carter, MD (1996) Watertown  
Richard Wake, MD (1996) Brookings  
Kevin Vaska, MD (1996) Sioux Falls  
Brian Tschida, MD (1996) Rapid city  
James Ryan, MD (1994) Sioux Falls  
Donald Habbe, MD (1994) Rapid City  
John Frank, MD (1994) Yankton  
Kevin Whittle, MD (1994) Sioux Falls  
Michael Keppen, MD (1995) Sioux Falls  
Michael Brown, MD (1995) Spearfish  
Jose Teixeira, MD (1995) Rapid City  
Angelina Trujillo, MD (1995) Sioux Falls  
Kevin Kavanaugh, MD (1995) Sioux Falls  
Thomas Luzier, MD (1996) Aberdeen

#### **COMMISSION ON PROFESSIONAL LIABILITY**

Mitchel Rydberg, MD (1995) Dell Rapids, Chairman  
Calvin Roseth, MD (1996) Watertown  
Stephen Dick, MD (1996) Rapid City  
William Sorrels, DO (1996) Mitchell  
John Robbins, MD (1995) Sioux Falls  
Robert VanDemark, Jr, MD (1995) Sioux Falls  
Lori Hansen, MD (1994) Yankton  
Douglas Traub, MD (1994) Rapid City  
Billy Fields, MD (1994) Sturgis

#### **COMMISSION ON CONTINUING MEDICAL EDUCATION**

Robert Raszkowski, MD (1995) Sioux Falls, Chairman  
James Gaede, MD (1995) Mitchell  
James Larson, MD (1996) Watertown  
Thomas Luzier, MD (1996) Aberdeen  
Henry Travers, MD (1994) Director of CME,  
McKenna Hosp.  
Jerome Freeman, MD (1994) Director of Medical  
Education, Sioux Valley Hosp.  
James Engelbrecht, MD (1994) Director of Medical  
Education, Rapid City Regional Hosp.  
Richard Holm, MD (1994) Director of Medical  
Education, Brookings Hosp.  
Lawrence Finney, MD (1994) Director of Medical  
Education, Central Plains Clinic

David Bean, MD (1994) Director of Medical Education, Charter Hosp.  
Willis F. Stanage, MD (1994) Director of Medical Education, Yankton CME Consortium  
(1994) Director of Medical Education, Fort Meade Veterans Administration

#### **CREDENTIALS COMMISSION AND EXECUTIVE COMMISSION**

Thomas Krafka, MD, Rapid City  
James Reynolds, MD, Sioux Falls  
Mary Carpenter, MD, Winner  
Rodney Parry, MD, Sioux Falls  
Robert Ferrell, MD, Rapid City  
Michael Pekas, MD, Sioux Falls  
James Engelbrecht, MD Rapid City  
Stephan Schroeder, MD, Miller  
M. George Thompson, DO, Watertown

#### **GRIEVANCE COMMISSION**

Frank Messner, MD (1994) Yankton, Chairman  
Michael Pekas, MD (1995) Sioux Falls  
J. A. Eckrich, Jr, MD (1996) Aberdeen  
Richard I. Porter, MD (1997) Yankton  
M. George Thompson, DO (1998) Watertown

#### **ARCHIVES AND HISTORY COMMISSION**

John Hoskins, MD (1994) Sioux Falls, Chairman  
Virginia Tracy (1994) Auxiliary  
Nathaniel Whitney, MD (1994) Rapid City  
Joseph Hamm, MD (1994) Sturgis  
Brooks Ranney, MD (1994) Yankton

#### **MEDICAL-LEGAL COMMITTEE**

Jerry Walton, MD (1994) Sioux Falls, Chairman  
Daniel Kennelly, MD (1994) Sioux Falls  
Walter Carlson, MD (1994) Sioux Falls  
Herb Saloum, MD (1994) Tyndall  
David Sandvik, MD (1994) Rapid City  
Stephan Schroeder, MD (1994) Miller  
David Hoversten, MD (1994) Sioux Falls

#### **DEPARTMENT OF SOCIAL SERVICES MEDICAL ADVISORY COMMITTEE**

James Engelbrecht, MD (1996) Rapid City

#### **FETAL ALCOHOL SYNDROME ADVISORY COMMISSION, SD HEALTH DEPARTMENT**

Michael Crandell, MD (1994) Kennebec

#### **SHARECARE COMMITTEE**

Tony Berg, MD (1994) Winner, Chairman  
David Sandvik, MD (1994) Rapid City  
Tad Jacobs, DO (1994) Flandreau  
Thomas Huber, MD (1994) Pierre  
James Reynolds, MD (1994) Sioux Falls  
Howard Saylor, Jr, MD (1994) Huron  
Robert Suurmeyer, MD (1994) Aberdeen  
Robert Westaby, MD (1994) Rapid City  
John Healy (1994) Clinic Manager

Ed Arshem (1994) Clinic Manager  
Robert Chleborad (1994) Clinic Manager

#### **AIDS TASK FORCE**

Bruce Lushbough, MD (1994) Brookings, Chairman  
Donald Humphreys, MD (1994) Sioux Falls  
Jerome Freeman, MD (1994) Sioux Falls  
Thomas Huber, MD (1994) Pierre  
Alfred Hartmann, MD (1994) Sioux Falls  
Michael McVay, MD (1994) Yankton  
Wendell Hoffman, MD (1994) Sioux Falls  
Richard Belatti, MD (1994) Madison

#### **ADVISORY COMMITTEE SD DRUG INFORMATION CENTER**

Richard Holm, MD (1994) Brookings

#### **MINUTES**

##### **BUDGET and AUDIT COMMITTEE**

5:00 pm Harvest Room, Ramkota Inn  
Wednesday, June 9, 1993 Sioux Falls, South Dakota

The meeting was called to order by Ken Peterson, MD, Chairman. Those present for roll call included Drs. Peterson, M. George Thompson, Thomas Krafka, Robert Ferrell, Michael Pekas, Stephan Schroeder, James Reynolds, Mary Carpenter, James Engelbrecht and Richard Porter and staff, Bob Johnson and Jan Anderson.

Dr. Pekas moved to approve the minutes of the previous meeting as printed and distributed. The motion was seconded and carried.

Mr. Johnson reviewed the audit prepared by McGladrey and Pullen. Dr. Porter moved to accept the audit as presented. The motion was seconded and carried.

There being no further business, the meeting adjourned at 5:10 pm.

#### **MINUTES**

##### **FIRST COUNCIL MEETING**

3:00 pm Harvest Room, Ramkota Inn  
Wednesday, June 9, 1993 Sioux Falls, SD

The meeting was called to order by James Engelbrecht, MD, Chairman at 3:00 pm. Those present were: Drs M. George Thompson, Ken Peterson, Thomas Krafka, James Reynolds, Robert L. Ferrell, Michael Pekas, Julie Stevens, James Engelbrecht, John Barlow, Stephan Schroeder, R.G. Nemer, Richard Porter, Joseph Hamm, Winston Odland, James Hovland, James Larson, Curtis Wait, Richard Holm, Phillip Hoffsten, Thomas Huber, Curtis Buchholz, Howard Saylor, Lucio Margallo, Jeffrey Hagen, K. Gene Koob, Rodney Parry, Robert Raskowski, Daniel Kennelly, Guy Tam, Lowell Hyland, C. Roger Stoltz, Larry Meyer, Bruce Mannes, Stephen Haas, Carol Zielike, Richard Renka, James Collins, Joseph Kass, and staff Robert Johnson, Jan Anderson, Donna Sievers, and Dean Krogman.

The minutes of the previous meeting were approved as printed and distributed.

The Council observed a moment of silence in memory of the late Governor George S. Mickelson.



## COMMISSION/COMMITTEE REPORTS

### BUDGET & AUDIT COMMITTEE/EXECUTIVE COMMISSION REPORT

Dr. Thompson reported to the Council regarding the Budget & Audit Committee/Executive Commission meeting on April 15. The Council noted a change to last years budget. There will be an increase in administrative reimbursement by the Board of Medical Examiners to the State Medical Association for the coming year. A motion was made by Dr. Saylor to approve the Report of the Budget and Audit Committee/Executive Commission. The motion was seconded and carried.

### REPORT OF THE COMMISSION ON PROFESSIONAL LIABILITY

Robert Johnson reported to the Council regarding the Commission on Professional Liability meeting on April 27. The Commission suggested establishment of criteria for professional liability companies in South Dakota. They recommended that a questionnaire be developed to assist member physicians in selecting the professional liability company which best fits their needs. Professional liability companies writing coverage in South Dakota would be asked to complete and return the information which would then be made available to the membership. A motion was made by Dr. Saylor to approve the report of the Commission on Professional Liability. The motion was seconded and carried.

**INTRODUCTION OF DEAN KROGMAN** - Robert Johnson introduced Dean Krogman, the newest member of the SDSMA staff. Mr. Krogman will be working jointly with the State Medical Association and DAKOTACARE in a public relations capacity and also as Director of Governmental Relations.

### OLD BUSINESS:

**NOMINATIONS FOR AMA APPOINTMENTS** - The Council reviewed requests from the AMA for nominations to the following committees: 1) Advisory Committee and Specialty Boards; 2) Women in Medicine Advisory Panel and 3) AMA Awards Program. No recommendations were made at this time but the Council was encouraged to keep this in mind and submit names of potential nominees at upcoming Council meetings.

**DISCUSSION ON SDSMA MISSION STATEMENT** - A motion was made by Dr. Parry that discussion on a mission statement for SDSMA be deferred to the September Council meeting. The motion was seconded and carried.

**DISCUSSION ON CME CONFERENCE LISTING IN SD JOURNAL OF MEDICINE** - Dr. Raszkowski asked the Council to consider the value of the CME listing presently published in the SD Journal of Medicine. A motion was made by Dr. Holm that a statewide CME conference listing continue to be published in the South Dakota Journal of Medicine. The motion was seconded and carried.

### NEW BUSINESS:

**APPOINTMENTS TO ENDOWMENT ASSOCIATION BOARD OF DIRECTORS** - A motion was made by Dr. Barlow to reappoint the following to the Endowment Board of Directors for a one year term: Drs. Joseph Hamm, Warren Jones, Howard Saylor, Bruce Lushbough, T.H. Sattler,

Robert Giebink, Bruce Allen. The motion was seconded and carried.

**APPOINTMENTS TO SODAPAC BOARD OF DIRECTORS** - A motion was made to appoint the following to the SoDaPAC Board of Directors for terms as indicated:

|                      |  |
|----------------------|--|
| Duane Reaney, MD     | (Eighth District - 3 years)            |
| Charles Hart, MD     | (Ninth District - 3 years)             |
| Anne Barlow          | (Ninth District Auxiliary - 3 years)   |
| Jackie Slingsby      | (Ninth District Auxiliary - 3 years)   |
| Marilyn Engelbrecht  | (Ninth District Auxiliary-3 years)     |
| Ruth Parry           | (Seventh District Auxiliary - 3 years) |
| Deana Barth          | (Seventh District Auxiliary - 3 years) |
| Cathy Brechtelsbauer | (District Seven Auxiliary-3 years)     |
| Dorothy Wheeler      | (Seventh District Auxiliary - 1 years) |
| Susan Tjarks         | (Sixth District Auxiliary - 3 years)   |
| Lee Brandt           | (Clinic Manager 3 years)               |
| Brad Randall, MD     | (Seventh District - 3 years)           |
| Michael Pekas, MD    | (Seventh District - 3 years)           |

The motion was seconded and carried.

**DISCUSSION ON LEADERSHIP/ORGANIZATIONAL MEETING FOR DISTRICT MEDICAL SOCIETY OFFICERS** - The Council discussed a notice received from the Minnesota Medical Society regarding a conference for county medical society officers and staff. Attendees receive information on the organizational structure, coordinated activities of the districts and state, report deadlines and hopefully this will promote member interest and activity. A motion was made by Dr. Raszkowski that the SDSMA Executive Commission plan a similar program this fall, inviting district medical society officers, young physicians, specialty society officers and staff. The motion was seconded and carried.

**REVIEW OF AMA PROPOSAL FOR STANDARD PACKAGE OF HEALTH CARE BENEFITS** - The Council reviewed a letter from Dr. James Todd, AMA Executive Vice President, regarding the AMA's recommended standard package of Health Care Benefits. This was accepted for information.

**REPORT ON HEALTH CARE REFORM** - Dr. Krafka reported to the Council regarding the status of health care reform in South Dakota. With Governor Mickelson's death, and Governor Miller just assuming office, state health care reform activities have slowed down considerably. A legislative interim committee has been formed and it is expected they will begin meeting sometime in July. This was accepted for information.

**PERCEPTIONS ON "HEALTH CARE REFORM"** - A motion was made by Dr. Odland that the following Resolution be submitted to the SD State Medical Association House of Delegates:

|                 |  |
|-----------------|--|
|                 | <b>RESOLUTION #6</b>   |
| <b>TO:</b>      | House of Delegates<br>South Dakota State Medical Association |
| <b>FROM:</b>    | Council<br>South Dakota State Medical Association            |
| <b>SUBJECT:</b> | Perceptions on "Health Care Reform"                          |

**WHEREAS,** President Clinton's Task Force on Health Care Reform continues its deliberations, and

**WHEREAS,** many states are actively involved in studies reviewing what is entitled "health care reform", and

**WHEREAS,** South Dakota physicians have followed with great interest these deliberations and participated when given an opportunity in such deliberations, and

**WHEREAS,** the primary thrust of such reform measures appears to be revision of the health care financing system rather than reforming the method of providing health care services, therefore

**BE IT RESOLVED,** that the House of Delegates of the South Dakota State Medical Association caution its members about viewing "health care reform" as something that may not actually improve access for our patients but that it appears such reform is heavily focused on ways of financing health care services.

The motion was seconded and carried.

**DAKOTACARE UPDATE** - Dr. Ferrell reported to the Council that DAKOTACARE's net worth has surpassed 2 million dollars and must now file with the SEC. He also reported changes in DAKOTACARE's stock valuation and contract changes for enrollees in the areas of skilled care (nursing facilities) and enlarged transplant services (based on survival statistics). An outside company has been retained for the purpose of evaluating stock and a report will be available by September 10. The Council discussed the Bylaw Amendment which will go to the House of Delegates on Thursday allowing physicians to transfer Class C, non-voting stock to their widows and children. This was accepted for information.

**REQUEST FOR MEDICAL CONSULTANT FOR SD DSS MEDICAID PROGRAM CARE MANAGEMENT SYSTEM** - The Council reviewed a letter from the SD DSS asking that a physician be named to fill the position of medical consultant to the SD DSS Medicaid Program Care Management System. The Council suggested that Dr. Don Frost be apprised of this position.

**REQUEST FOR CHANGE IN ANNUAL MEETING DATES** - The Council reviewed a letter from Ruth Parry regarding possible alternate dates for the SDSMA annual meeting. The AMA meeting presently overlaps with the SDSMA annual meeting and business which would normally be taken to the national meeting cannot be considered prior to the AMA's meeting in December. A motion was made by Dr. Holm that the executive office look into available dates during the months of April or May and report to the House of Delegates. The motion was seconded and carried.

**VOTE ON CLASS B SHARES OF DAKOTACARE STOCK** - The Council discussed two DAKOTACARE resolutions which will be submitted to the House of Delegates on Thursday. A motion was made by Dr. Saylor that the Council support the two DAKOTACARE Resolutions concerning Class B stock shares. The motion was seconded and carried.

**GOVERNOR MICKELSON MEMORIAL FUND** - Mr. Johnson reported that over \$15,000 has been gifted to the Endowment Association scholarship fund in memory of the

late Governor Mickelson. This was accepted for information.

**WATERTOWN PILOT PROGRAM** - Dr. Larson reported to the Council that Watertown has been approached by Medicaid to establish a pilot a program using a managed care/gatekeeper concept and that he will keep the Council apprised as this program develops. This was accepted for information.

**PIERRE PILOT PROGRAM** - Dr. Huber reported to the Council that no further action has been taken to date regarding the pilot program in Pierre for state employees which was discussed at the last Council meeting. This was accepted for information.

There being no further business, the meeting adjourned at 4:50 pm.

## MINUTES SECOND COUNCIL MEETING

Saturday, June 12, 1993  
Sioux Falls, SD

Harvest Room  
Ramkota Inn

The meeting was called to order by James Engelbrecht, MD, Chairman. Those present for roll call were: Drs. Thomas Krafka, James Reynolds, Mary Carpenter, Robert L. Ferrell, James Engelbrecht, Stephan Schroeder, M. George Thompson, James Hovland, James Larson, Stephen Gehring, Curtis Wait, Richard Holm, Phillip Hoffsten, Thomas Huber, Curtis Buchholz, Howard Saylor, Lucio Margallo, K. Gene Koob, Guy Tam, C. Roger Stoltz, Robert Raszkowski, Jeffrey Hagen, Daniel Kennelly, Larry Meyer, Stephen Haas, Carol Zielike, Richard Renka, Joseph Kass, Staff, Robert Johnson, Jan Anderson, Donna Sievers and Dean Krogman. A motion was made to dispense with the reading of the minutes of the previous meeting. The motion was seconded and carried.

### BUSINESS:

**SEATING OF NEW COUNCILORS AND ALTERNATE COUNCILORS** - Dr. Engelbrecht introduced the following newly elected and re-elected councilors and alternate councilors:

### COUNCILORS:

|                           |                               |
|---------------------------|-------------------------------|
| Aberdeen District #1      | James Hovland, MD (3 years)   |
| Watertown District #2     | Stephen Gehring, MD (3 years) |
| Brookings/Madison Dist #3 | Curtis Wait, MD (3 years)     |
|                           | Richard Holm, MD (2 years)    |
| Pierre District #4        | Thomas Huber, MD (3 years)    |
| Huron District #5         | Curtis Buchholz, MD (3 years) |
|                           | Howard Saylor, MD (2 years)   |
| Mitchell District #6      | Walter Baas, MD (3 years)     |
| Sioux Falls District #7   | Jeffrey Hagen, MD (3 years)   |
|                           | Lowell Hyland, MD (3 years)   |
|                           | Daniel Kennelly, MD (3 years) |
| Black Hills District #9   | Carol Zielike, MD (3 years)   |
| Rosebud District #10      | Richard Kafka, MD (1 year)    |
|                           | Gregg Tobin, MD (3 years)     |



Northwest District #11 Ben Henderson, DO (3 years)  
Whetstone Valley Dist #12 Alan Bloom, MD (3 years)

**ALTERNATE COUNCILORS:**

Aberdeen District #1 Reid Holkesvik, MD (3 years)  
Watertown District #2 Ken Peterson, MD (2 years)  
Ken Johnson, MD (3 years)  
Brookings/Madison Dist #3 Richard Sample, MD (3 years)  
Tad Jacobs, DO (2 years)  
Pierre District #4 Ken Bartholomew, MD (2 years)  
Noel Chicoine, MD (3 years)  
Huron District #5 Jeff Hanson, MD (3 years)  
Jeff Wheeler, MD (2 years)  
Sioux Falls District #7 Daniel Blue, MD (3 years)  
Robert VanDemark, Jr, MD (3 years)  
John Sall, MD (3 years)  
Black Hills District #9 John Barlow, MD (3 years)  
Charles Hart, MD (1 year)  
Whetstone Valley Dist #12 Joseph Kass, MD (3 years)

**DATES FOR 1993-94 COUNCIL MEETINGS** - The Council reviewed and confirmed the following dates for the 1993-94 Council meetings:

Friday, September 24 - Sioux Falls

Friday, November 19 - Pierre

Friday, April 8 - Sioux Falls

**SODAPAC UPDATE** - A motion was made by Dr. Hagen to appoint Helen Owens to the SoDaPAC Board of Directors representing the Sioux Falls District Auxiliary. The motion was seconded and carried.

**RESOLUTION SUBMITTED FROM DR. RENKA** - Dr. Renka submitted a resolution to the Council from the Psychiatric Association recommending that managed care programs not be allowed to use out of state physicians to review South Dakota doctors unless the review is requested by the doctor. A motion was made by Dr. Renka that this Resolution be submitted to the Commission on Legislation. After further discussion a vote was cast and the motion failed. Several questions were raised including: 1) can physicians not licensed in the state review and direct patient care or is this considered the practice of medicine; 2) could legislation be passed requiring physician reviewers to be licensed in the state where they are performing reviews; 3) What are the medical ethics and legality of discussing a patient's care over the telephone with such reviewers. Dr. Holm moved that the executive office ask legal counsel Dave Gerdes for his opinion regarding the questions raised and the resolution submitted and report back to the Council in September. The motion was seconded and carried.

**ELECTION OF COUNCIL SECRETARY-TREASURER** - Dr. Holm nominated Rodney Parry, MD, as Secretary-Treasurer to complete the unexpired term of Dr. Carpenter. He moved that nominations cease and a unanimous ballot be cast for Dr. Parry. The motion was seconded and carried.

**ELECTION OF COUNCIL CHAIRMAN** - Dr. Saylor nominated James Engelbrecht, MD, as Chairman of the Council. He moved that nominations cease and a unani-

mous ballot be cast for Dr. Engelbrecht. The motion was seconded and carried.

**YOUNG PHYSICIANS CAUCUS** - Dr. Carpenter reported to the Council concerning a Bill which is currently before the Senate Finance Committee to eliminate discriminatory Medicare reimbursement for young physicians. She urged physicians to contact Senator Daschle voicing support for this legislation. This was accepted for information.

There being no further business, the meeting adjourned at 11:10 am.

**MINUTES  
FIRST HOUSE OF DELEGATES**

9:30 am Bay Rooms, Ramkota Inn  
Thursday, June 10, 1993 Sioux Falls, SD

The meeting was called to order by Stephan Schroeder, MD, Speaker of the House. Those present for roll call were doctors: M. George Thompson, Thomas Krafka, James Reynolds, Mary Carpenter, Stephan Schroeder, James Engelbrecht, Robert Ferrell, Michael Pekas, Richard Porter, James Hovland, Stephen Gehring, Richard Holm, Thomas Huber, Curtis Buchholz, Lucio Margallo, Jeffrey Hagen, Rodney Parry, Lowell Hyland, Robert Raszowski, Larry Meyer, Richard Renka, John Barlow, Gregg Tobin, James Collins, Joseph Kass, Winston Odland, James Larson, Curtis Wait, Phillip Hoffsten, Howard Saylor, K. Gene Koob, Guy Tam, Daniel Kennelly, Carol Zielike, Stephen Haas, John Vidoloff, Paul Eckrich, Jerome Eckrich, William Taylor, Roger Carter, Steven Feeney, Aaron Shives, Tad Jacobs, Gerald Turner, Brent Lindbloom, Ken Bartholomew, Jeffrey Hanson, Angelina Trujillo, Amanda Story, Janet Smith, Patti Giebink, Tom Reynolds, Walter Carlson, James Ryan, Karla Murphy, Robert Talley, R. Maclean Smith, Donald Knudson, David Bean, Russell Harris, Laura Larsen, David Smith, Jem Hof, Duane Reaney, Thomas Hermann, Lew Papendick, Charles Hart, O. Myron Jerde, Allen Nord, James Rud, Jeanne Bennett, Nathaniel Whitney, H. Lee Ahrlin, Joseph Hamm, Harland Hermann, John Malm, and students Bill Rizk and Ronald Divine.

Dr. Meyer moved to approve the minutes of the previous meeting as printed and distributed. The motion was seconded and carried.

Dr. Schroeder announced the appointment of the following to serve on the Nominating Committee: Drs. James Hovland; Steven Feeney; Richard Holm; Phillip Hoffsten; Stephan Schroeder; Lucio Margallo; Robert Raszowski, Chairman; Jem Hof; Craig Hansen; John Malm; James Collins and Joseph Kass.

Dr. Schroeder announced the appointment of the Reference Committees as follows:

Reference Committee on Credentials, Resolutions and Memorials and Reports of Officers and Councilors: Drs. K. Gene Koob, Chairman; William Taylor, Patricia Giebink, H. Thomas Hermann, Jr., Donald Knudson, Duane Reaney, James Rud, Howard Saylor, Amanda Story, Robert Talley, Gerald Turner and John VanderWoude.

Reference Committee on Reports of Commissions on Medical Service; Legislation and Governmental Relations: Drs. Jeffrey Hagen, Chairman; David Bean, Walter Carlson, Jeffrey Hanson, Ben Henderson, O. Myron Jerde, Patricia Malters, Nathaniel Whitney, J. Michael McMillin, Winston

Odland, Richard Renka, Robert Rietz, John Sall, Vance Thompson and student Bill Rizk.

Reference Committee on Reports of Commissions on Scientific Medicine; Internal Affairs, Communications and Liaison; and Professional Liability: Drs. Rodney Parry, Chairman; Ronald Anderson, Curtis Buchholz, Roger Carter, Joe Chang, Lowell Hyland, Richard Kafka, Laura Larsen, Brent Lindbloom, Allen Nord, James Ryan, Julie Stevens, C. Roger Stoltz, Angelina Trujillo, Robert Vandemark, Jr., Curtis Wait, Carol Zielike and Lew Papendick.

Reference Committee on Reports of Special Committees and Miscellaneous Business: Drs. David Smith, Chairman; Nancy Carroll, Paul Eckrich, Stephen Haas, Robert Hohm, Guy Tam, R. Maclean Smith, Bruce Mannes, Karla Murphy, Tommy Reynolds, Jeanne Bennett, Aaron Shives, Janet Smith and student Ronald Divine.

Dr. Schroeder referred the reports of officers and councilors to Reference Committee #1.

Dr. Schroeder called for the introduction of resolutions from the Council which have not been published in the Delegate's Handbook. Dr. Engelbrecht introduced Resolution #6 regarding perceptions of health care reform. Dr. Schroeder referred this to Reference Committee #2.

#### RESOLUTION #6

**TO:** House of Delegates  
South Dakota State Medical Association

**FROM:** Council  
South Dakota State Medical Association

**SUBJECT:** Perceptions on "Health Care Reform"

**WHEREAS,** President Clinton's Task Force on Health Care Reform continues its deliberations, and

**WHEREAS,** many states are actively involved in studies reviewing what is entitled "health care reform", and

**WHEREAS,** South Dakota physicians have followed with great interest these deliberations and participated when given an opportunity in such deliberations, and

**WHEREAS,** the primary thrust of such reform measures appears to be revision of the health care financing system rather than reforming the method of providing health care services, therefore

**BE IT RESOLVED,** that the House of Delegates of the South Dakota State Medical Association caution its members about viewing "health care reform" as something that may not actually improve access for our patients but that it appears such reform is heavily focused on ways of financing health care services.

*Resolution was rejected at the Second House of Delegates' meeting.*

Dr. Schroeder called for introduction of resolutions from district medical societies which have not been published in the Delegate's Handbook. Being none he called for the

introduction of resolutions by individual members which have not been published in the Delegate's Handbook. Dr. Holm introduced Resolution #5 regarding COLA. Dr. Schroeder referred Resolution #5 to Reference Committee #1.

#### RESOLUTION #5

**TO:** House of Delegates  
South Dakota State Medical Association

**FROM:** Executive Committee  
South Dakota Society of Internal Medicine  
Richard Holm, MD, president  
Loren Tschetter, MD, vice president  
David Sandvik, MD, secretary

**SUBJECT:** Commission on Office Laboratory Accreditation (COLA)

**WHEREAS,** the Commission on Office Laboratory Accreditation (COLA) is a non-profit education and accreditation organization for the physician office laboratory established by the American Academy of Family Physicians, the American Medical Association, the American Society of Internal Medicine and the College of American Pathologists; and

**WHEREAS,** the federal CLIA 88 law gives physicians the right to seek accreditation by a private, non-profit accreditation program; and

**WHEREAS,** the Commission on Office Laboratory Accreditation is the only physician sponsored peer-review alternative to CLIA 88;

**BE IT RESOLVED,** that the South Dakota State Medical Association endorse the accreditation program for office laboratories of the Commission on Office Laboratory Accreditation; and

**BE IT FURTHER RESOLVED,** that the South Dakota State Medical Association publicize information about Commission on Office Laboratory Accreditation and encourage that all physicians seek clinical laboratory accreditation through COLA in lieu of federal certification.

*Resolution was amended to delete "in lieu of federal certification" in the final Resolve. The resolution as amended was adopted at the Second House of Delegates' meeting.*

Dr. Schroeder referred pages 1-16 and Resolution #5 to the Reference Committee on Credentials, Resolutions and Memorials; Reports of Officers and Councilors.

Dr. Schroeder referred pages 17-19 and Resolutions #1 and #6 to the Reference Committee on Reports of Commissions on Medical Service; Legislation and Governmental Relations.

#### RESOLUTION #1

**TO:** House of Delegates, South Dakota State Medical Association



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**FROM:** Seventh District Medical Society  
(Robert Giebink, MD)

**SUBJECT:** Safety Restraint Legislation

**WHEREAS,** during the last calendar year, we have lost 60, mostly young people, in roll-over accidents and probably at least 90% of these could have been saved or prevented had the individuals been wearing a safety restraint, and

**WHEREAS,** South Dakota is now third to the last state in the use of seat belts with fewer than 20-25% of the drivers buckling up, and probably fewer than 10% of teenage drivers using seat belts, and

**WHEREAS,** without a law on the books, teenage drivers will much more easily submit to peer pressure which poo-poops their use of seat belts, and in fact, without a law on the books, long-time seat belt users like myself and many other doctors often tend to develop bad habits of not buckling up when it is inconvenient to do so, and

**WHEREAS,** the South Dakota State Medical Association in the past has endorsed, but never enthusiastically introduced and supported a seat belt bill, it is the opinion of at least this one individual that if the South Dakota State Medical Association came out in full force and all of the doctors in the association responded by contacting and convincing their patients, particularly those who are members of the legislature, that such a life-saving safety restraint bill is necessary, such a bill could be passed, and

**WHEREAS,** the physicians' main purpose in life should be to keep our patients healthy, happy and above all, alive, that we should not hesitate to use every method at our disposal and join in a united effort to convince our patients and their families to buckle up, therefore

**BE IT RESOLVED,** that the South Dakota State Medical Association introduce and sponsor a safety restraint bill similar to the one that was introduced this past year with one exception, the penalty should be a warning by the law officers and an appropriate lecture. This could be combined with compulsory attendance at an automobile safety class which could be carried out by the South Dakota Department of Safety, and further

**BE IT RESOLVED,** that one of the best arguments to convince our patients and friends to use seat belts is to use them ourselves on all occasions. Another effective way to educate our patients would be to have printed on the back of our prescription blanks language that reads something

like this: "Dear Patient: For the life and health of you and your family, please buckle up whenever you get into your car. This is perhaps the most life-preserving and certainly the cheapest prescription I can give you. I buckle up and so does my family. The life you save may be your child's or your best friend's or your own." In addition, doctors could keep a supply of "buckle up bumper stickers" on hand and encourage their patients to put them on their cars.

*Resolution was amended to delete "poo-poops" in the third Whereas and replace it with "ridicules." The resolution as amended was adopted at the Second House of Delegates' meeting.*

Dr. Schroeder referred pages 20-25 and Bylaw Amendments #1 and #2 to the Reference Committee on Reports of the Commissions on Scientific Medicine; Internal Affairs, Communications and Liaison; and Professional Liability.

#### BYLAW AMENDMENT #1

**TO:** House of Delegates  
South Dakota State Medical Association

**FROM:** Council  
South Dakota State Medical Association

**SUBJECT:** Bylaw Amendment to Establish CME Commission

#### ARTICLE X COMMISSIONS

##### Section 4.

In addition to the foregoing commissions there shall be an Executive Commission, a Grievance Commission, a Credentials Commission, a Professional Liability Commission (((, a Continuing Medical Education Commission))) and an Archives and History Commission.

((f. Continuing Medical Education Commission - The Continuing Medical Education Commission shall consist of four (4) members appointed by the President for three year terms, the physician Director of Medical Education or equivalent physician position for each institution accredited by the Commission; and the Chairman of the Commission on Scientific Medicine and the Dean of Continuing Medical Education of the USD School of Medicine, both of whom shall serve as ex officio members with all rights of appointed commission members. If the physician Director of Medical Education or equivalent physician position does not meet the requirements as stated in Article VI, Section 8 of these Bylaws, the physician Associate Director of Medical Education or equivalent physician position or another representative of the accredited institution who does qualify under Article VI, Section 8, shall serve. The original presidential appointments shall have two of the four members appointed for three (3) years and the other two members appointed for two (2) years. Of the four members appointed by the president, none shall serve on this Commission for more than three consecutive terms or nine (9) years and no member shall serve as chairman of this Commission for more than nine (9) consecutive years. The commission's duties shall include but not be limited to:



1. Evaluating potential South Dakota sponsors of AMA credit baring CME and accredit those meeting the Essentials, Guidelines and Standards of the Accreditation Council for Continuing Medical Education (ACCME).
2. Facilitating the exchange of CME needs and educational opportunities within South Dakota.
3. Monitoring the quality of CME within the state of South Dakota and reviewing member compliance with SDSMA's CME requirements.

The commission may report to the Council from time to time and shall report to the House of Delegates on an annual basis.)))

----- = deletion

(( ( )) ) = addition

*Bylaw Amendment #1 was amended to correct "baring" in #1 to "bearing" and to delete "and reviewing member compliance with SDSMA's CME requirements" in #3. The amended Bylaw #1 was adopted at the Second House of Delegates' meeting.*

#### BYLAW AMENDMENT #2

**TO:** House of Delegates  
South Dakota State Medical Association

**FROM:** Council  
South Dakota State Medical Association

**SUBJECT:** Bylaw Amendment Eliminating the Five Percent Random Audit for CME

#### ARTICLE III MEMBERSHIP

##### Section 1.

"Active members of the Association shall be expected to (((remain current in their medical knowledge by participation in continuing medical education on a regular basis.))) complete 45 hours of Category 1, or comparable prescribed hours by specialty societies of continuing medical education credits over a three year period of time. Accumulation of such credit hours began January 1, 1981. A five percent random audit of the active membership of the Association shall be conducted triannually beginning in 1984 to determine the compliance with Section 1, Article III of the bylaws."

----- = deletion

(( ( )) ) = addition

*Bylaw Amendment #2 was adopted at the Second House of Delegates' meeting.*

Dr. Schroeder referred pages 26-33 and Resolutions #2, #3 and #4 to the Reference Committee on Reports of Special Committees and Miscellaneous Business.

#### RESOLUTION #2

**TO:** House of Delegates, South Dakota State Medical Association

**FROM:** Seventh District Medical Association

**SUBJECT:** DAKOTACARE

WHEREAS,

DAKOTACARE was formed by the physicians of South Dakota for the purpose of providing quality medical care at a reasonable price and to compete with any outside HMO which might enter South Dakota and to benefit the founding physicians,

**BE IT RESOLVED,** that the DAKOTACARE Board of Directors be directed to cease and desist from all activities that would promote for public offering the stock in DAKOTACARE for the next 5 years of operation.

*Resolution #2 was rejected at the Second House of Delegates' meeting.*

#### RESOLUTION #3

**TO:** House of Delegates, South Dakota State Medical Association

**FROM:** Seventh District Medical Society

**SUBJECT:** DAKOTACARE

WHEREAS, DAKOTACARE has authority to distribute a total of 50,000 shares of Class C Preferred Stock without changing legal requirements, and

WHEREAS, DAKOTACARE was originally meant to be owned and directed by physicians that are providing service to patients insured by DAKOTACARE,

**BE IT RESOLVED,** that the contingency reserve be offered annually in Class C stock or cash to the extent of stock available with stock value established on a yearly basis at fair market value.

*Resolution #3 was rejected at the Second House of Delegates' meeting.*

#### RESOLUTION #4

**TO:** House of Delegates, South Dakota State Medical Association

**FROM:** Seventh District Medical Society

**SUBJECT:** DAKOTACARE

WHEREAS, DAKOTACARE was originally meant to be a physician owned and directed company, and

WHEREAS, the primary purchasers of stocks in the past few years have been insurance companies, and

WHEREAS, DAKOTACARE does not have a system for buying back stock from stockholders,

**BE IT RESOLVED,** that DAKOTACARE be authorized to buy back Class C stock from physicians or insurance companies that want to sell their stock and that DAKOTACARE keep a list of physicians that are interested in pur-

chasing stock and aid them in purchasing this type of stock at fair market value.

*Resolution #4 was amended deleting the second and third Whereas. The resolution as amended was adopted at the Second House of Delegates' meeting.*

Dr. Schroeder announced the various corporate body sessions scheduled and other business, education and social events scheduled throughout the remainder of the annual meeting.

There being no further business the meeting adjourned at 10 am.

## MINUTES OF THE SECOND HOUSE OF DELEGATES

10:00 am Washington Room, Ramkota Inn  
Saturday, June 12, 1993 Sioux Falls, SD

The meeting was called to order at 10:05 am, by Stephan Schroeder, MD, Speaker of the House. Those present for roll call were doctors M. George Thompson, Thomas Krafka, James Reynolds, Mary Carpenter, Stephan Schroeder, James Engelbrecht, Robert Ferrell, Richard Porter, James Hovland, Stephen Gehring, James Larson, Richard Holm, Thomas Huber, Curtis Buchholz, Howard Saylor, Lucio Margallo, Jeffrey Hagen, K. Gene Koob, Guy Tam, C. Roger Stoltz, Robert Raszkowski, Daniel Kennelly, Larry Meyer, Bruce Mannes, Richard Renka, Carol Zielike, Stephen Haas, Joseph Kass, Paul Eckrich, John Vidoloff, Joe P. Chang, William Taylor, Roger Carter, Steven Feeney, Aaron Shives, Robert Rietz, Gerald Turner, Brent Lindbloom, Robert Hohm, Jeffrey Hanson, Carey Buhler, Angelina Trujillo, Amanda Story, Janet Smith, Patti Giebink, Nancy Caroll, Robert VanDemark Jr, Tom Reynolds, Walter Carlson, James Ryan, Karla Murphy, Donald Knudson, David Bean, R. Maclean Smith, David Smith, Jem Hof, Duane Reaney, Julie Stevens, Charles Hart, O. Myron Jerde, Allen Nord, James Rud, Nathaniel Whitney, H. Lee Ahrlin, Joseph Hamm, John Malm and Student, Ronald Divine. A quorum was present and the meeting was declared competent to proceed.

A motion was made to dispense with the reading of the minutes of the previous meeting inasmuch as they will be printed and distributed. The motion was seconded and carried.

Dr. Robert Raszkowski read the Report of the Nominating Committee.

### REPORT OF THE NOMINATING COMMITTEE

The Nominating Committee submits the following recommendations for the consideration of the House of Delegates:

#### OFFICERS

|                      |                       |
|----------------------|-----------------------|
| President-Elect      | James Reynolds, MD    |
| Vice-President       | Mary Carpenter, MD    |
| Speaker of the House | Stephen Schroeder, MD |

#### COUNCILORS

|                       |                               |
|-----------------------|-------------------------------|
| Aberdeen District #1  | James Hovland, MD (3 years)   |
| Watertown District #2 | Stephen Gehring, MD (3 years) |

|                           |                               |
|---------------------------|-------------------------------|
| Brookings/Madison Dist #3 | Curtis Wait, MD (3 years)     |
|                           | Richard Holm, MD (2 years)    |
| Pierre District #4        | Thomas Huber, MD (3 years)    |
| Huron District #5         | Curtis Buchholz, MD (3 years) |
|                           | Howard Saylor, MD (2 years)   |
|                           | Walter Baas, MD (3 years)     |
| Mitchell District #6      | Jeffrey Hagen, MD (3 years)   |
| Sioux Falls District #7   | Lowell Hyland, MD (3 years)   |
|                           | Daniel Kennelly, MD (3 years) |
|                           | Carol Zielike, MD (3 years)   |
| Black Hills District #9   | Richard Kafka, MD (1 year)    |
| Rosebud District #10      | Gregg Tobin, MD (3 years)     |
|                           | Ben Henderson, DO (3 years)   |
| Northwest District #11    | Alan Bloom, MD (3 years)      |
| Whetstone Valley Dist #12 |                               |

#### ALTERNATE COUNCILORS

|                           |                                    |
|---------------------------|------------------------------------|
| Aberdeen District #1      | Reid Holkesvik, MD (3 years)       |
| Watertown District #2     | Ken Peterson, MD (2 years)         |
|                           | Ken Johnson, MD (3 years)          |
| Brookings/Madison Dist #3 | Richard Sample, MD (3 years)       |
|                           | Tad Jacobs, DO (2 years)           |
| Pierre District #4        | Ken Bartholomew, MD (2 years)      |
|                           | Noel Chicoine, MD (3 years)        |
| Huron District #5         | Jeff Hanson, MD (3 years)          |
|                           | Jeff Wheeler, MD (2 years)         |
| Sioux Falls District #7   | Daniel Blue, MD (3 years)          |
|                           | Robert VanDemark, Jr, MD (3 years) |
|                           | John Sall, MD (3 years)            |
| Black Hills District #9   | John Barlow, MD (3 years)          |
|                           | Charles Hart, MD (1 year)          |
| Whetstone Valley Dist #12 | Joseph Kass, MD (3 years)          |

#### ANNUAL MEETING SITE

1994 - Rapid City, SD, June 9-11, 1994

1995 - Sioux Falls, SD, June 8-10, 1995

1996 - Black Hills area - the membership is to be polled for preferred dates:1) late April, 2) early May, 3) first or second week in June or 4) other (sometime between July and November)

Respectfully submitted,  
NOMINATING COMMITTEE  
Robert Raszkowski, MD, Chairman  
James Hovland, MD  
Steven Feeney, MD  
Richard Holm, MD  
Phillip Hoffsten, MD  
Stephen Schroeder, MD  
Lucio Margallo, MD  
Jem Hof, MD  
James Collins, MD  
Joseph Kass, MD

A motion was made that the Report of the Nominating Committee be approved. The motion was seconded and carried.



Dr. K. Gene Koob read the Report of the Reference Committee on Credentials, Resolutions and Memorials and Reports of Officers and Councilors.

# REPORT OF THE REFERENCE COMMITTEE ON CREDENTIALS, RESOLUTIONS AND MEMORIALS AND REPORTS OF OFFICERS AND COUNCILORS

The following delegates, alternate delegates, officers and councilors of the South Dakota State Medical Association were present: Doctors M. George Thompson, Thomas Krafka, James Reynolds, Mary Carpenter, Stephan Schroeder, James Engelbrecht, Robert Ferrell, Michael Pekas, Richard Porter, James Hovland, Stephen Gehring, Richard Holm, Thomas Huber, Curtis Buchholz, Lucio Margallo, Jeffrey Hagen, Rodney Parry, Lowell Hyland, Robert Raszowski, Larry Meyer, Richard Renka, John Barlow, Gregg Tobin, James Collins, Joseph Kass, Winston Odland, James Larson, Curtis Wait, Phillip Hoffsten, Howard Saylor, K. Gene Koob, Guy Tam, Daniel Kennelly, Carol Zielike, Stephen Haas, John Vidoloff, Paul Eckrich, Jerome Eckrich, William Taylor, Roger Carter, Steven Feeney, Aaron Shives, Tad Jacobs, Gerald Turner, Brent Lindbloom, Ken Bartholomew, Jeffrey Hanson, Angelina Trujillo, Amanda Story, Janet Smith, Patti Giebink, Tom Reynolds, Walter Carlson, James Ryan, Karla Murphy, Robert Talley, R. Maclean Smith, Donald Knudson, David Bean, Russell Harris, Laura Larsen, David Smith, Jem Hof, Duane Reaney, Thomas Hermann, Lew Papendick, Charles Hart, O. Myron Jerde, Allen Nord, James Rud, Jeanne Bennett, Nathaniel Whitney, H. Lee Ahrlin, Joseph Hamm, Harland Hermann, John Malm, and students Bill Rizk and Ronald Divine.

A quorum was present for the meeting of the House of Delegates. Total registration for the convention is 279, including 146 physicians, 11 guests, 71 Auxiliary members, and 51 sponsoring companies.

*The reference committee reviewed the reports of the officers and councilors and recommends they be accepted as submitted.*

The committee submits the following resolution for the consideration of the House of Delegates:

**WHEREAS,** numerous people have been involved in planning, arranging and ensuring the success of the 1993 Annual Meeting of the South Dakota State Medical Association,

**BE IT RESOLVED,** that the State Medical Association express its appreciation and thanks to the Seventh District physicians and the Seventh District, Mitchell District and Huron District Auxiliaries for their endeavors, and

**BE IT RESOLVED,** that the State Medical Association extend its thanks to the management of the Ramkota Inn, Willow Run Golf Course, and Valley West for their excellent facilities and staff, and

**BE IT RESOLVED,** that the State Medical Association extend its thanks to the Sioux Falls Argus Leader, KELO-TV and radio, KDLT-TV, KOTA-TV, KEVN-TV, KSFY-TV and KAUR, KCFS, KCSO, KNWC, KRSD, KSOO and KXRB for publicizing this event, and

**BE IT RESOLVED,** that the State Medical Association extend special gratitude to the sponsoring companies for their support and participation, and

**BE IT FURTHER RESOLVED,** that \$100 be donated to the South Dakota Medical School Endowment Association in memory of each of the following physicians who died during the past year:

George W. Smith, MD, Sioux Falls  
 Everett R. Maresh, MD, Sioux Falls  
 David Halliday, MD, Lake Preston  
 Charles Stern, MD, San Diego, CA  
 (formerly Sioux Falls)  
 William T. Sweeny, MD, North Bend, OR  
 (formerly Aberdeen)  
 Alonzo P. Peeke, MD Volga  
 Warren Reinoehl, MD, Custer  
 Denny G. Ortmeier, MD, Sioux Falls  
 James A. Cline, MD, Canoga Park, CA  
 (formerly Rapid City)  
 Bruce T. Brookman, MD, Wagner



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| Flounder                          | 2.6        | 3.3%                       | 116         | 198        |
| Skinless Chicken Breast           | 6.0        | 7.5%                       | 144         | 280        |
| Ordinary Beef Tenderloin          | 17.0       | 21.3%                      | 142         | 358        |

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The Reference Committee considered Resolution #5 and recommends adoption of this resolution with the following amendment to the second Resolved:

**"BE IT FURTHER RESOLVED**, that the South Dakota State Medical Association publicize information about the Commission on Office Laboratory Accreditation and encourage that all physicians seek clinical laboratory accreditation through COLA."

Respectfully submitted,  
**REFERENCE COMMITTEE ON CREDENTIALS,  
RESOLUTIONS AND REPORTS OF OFFICERS AND  
COUNCILORS**

K. Gene Koob, MD, Chairman  
William Taylor, MD  
Patricia K. Giebink, MD  
H. Thomas Hermann, Jr., MD  
Donald Knudson, MD  
James Rud, MD  
Amanda Story, MD  
Gerald Turner, MD  
Daniel Kennelly, MD  
John Barlow, MD

A motion was made to accept the Report of the Reference Committee on Credentials, Resolutions, and Memorials and Reports of Officers and Councilors. The motion was seconded and carried.

Dr. Jeffrey Hagen read the report of the Reference Committee on Reports of the Commission on Medical Service and the Commission on Legislation and Governmental Relations.

**REPORT OF THE REFERENCE COMMITTEE ON  
REPORTS OF THE COMMISSIONS ON MEDICAL  
SERVICE; AND LEGISLATION AND GOVERNMENTAL  
RELATIONS**

The Reference Committee reviewed the report of the Commission on Medical Service and recommends that a representative of the South Dakota Psychiatric Association be invited to attend the next meeting of the Commission to assist the Commission in the preparation of a letter of concern about the disparity between covered mental health benefits as opposed to other covered health benefits for state employees. The Committee also recommends that the Commission on Medical Service investigate ways to ensure physician input regarding Workers' Compensation in South Dakota. With these two recommendations the Reference Committee recommends acceptance of this report.

The Reference Committee reviewed Resolution #1 and recommends adoption of this resolution with an amendment to change "poo poos" in paragraph #3 to "ridicules."

The Reference Committee reviewed Resolution #6 and after much discussion recommends rejection of this resolution.

Respectfully submitted  
**REFERENCE COMMITTEE ON REPORTS OF THE  
COMMISSIONS ON MEDICAL SERVICE AND  
LEGISLATION AND GOVERNMENTAL RELATIONS**

Jeffrey Hagen, MD, Chairman  
David W. Bean, MD  
Walter O. Carlson, MD  
Jeffrey W. Hanson, MD  
Winston B. Odland, MD  
Richard P. Renka, MD  
Tad Jacobs, DO

John C. Sall, MD  
Loren Tschetter, MD  
Doug Traub, MD  
Robert Giebink, MD  
James Engelbrecht, MD  
Bill Rizk, Student

A motion was made to accept the report of the Reference Committee on Reports of the Commissions on Medical Service; and Legislation and Governmental Relations. The motion was seconded and carried.

Dr. C. Roger Stoltz read the report of the Reference Committee on Reports of the Commissions on Scientific Medicine; Internal Affairs, Communications and Liaison; and Professional Liability.

**REPORT OF THE REFERENCE COMMITTEE ON  
REPORTS OF THE COMMISSIONS ON SCIENTIFIC  
MEDICINE; INTERNAL AFFAIRS, COMMUNICA-  
TIONS AND LIAISON; AND PROFESSIONAL LIABILITY**

The Reference Committee reviewed the report of the Commission on Scientific Medicine. The Reference Committee recommends acceptance of this report.

The Reference Committee reviewed the report of the Commission on Internal Affairs, Communications and Liaison. The Reference Committee recommends acceptance of this report.

The Reference Committee reviewed the proposed budget for the fiscal year 1993-94. The Reference Committee recommends acceptance of the budget.

The Reference Committee reviewed the report of the Commission on Professional Liability. The Reference Committee recommends acceptance of this report.

The Reference Committee reviewed Bylaw Amendment #1 to Establish a CME Commission. The Reference Committee recommends acceptance of this bylaw amendment.

The Reference Committee reviewed Bylaw Amendment #2 to Eliminate the Five Percent Random Audit for CME. The Reference Committee recommends acceptance of this bylaw amendment.

Respectfully submitted,  
**REFERENCE COMMITTEE ON REPORTS OF THE  
COMMISSIONS ON SCIENTIFIC MEDICINE;  
INTERNAL AFFAIRS, COMMUNICATIONS AND  
LIAISON; AND PROFESSIONAL LIABILITY**

Rodney R. Parry, MD, Chairman  
Curtis Buchholz, MD  
Roger L. Carter, MD  
Lowell J. Hyland, MD  
Laura Larsen, MD  
Brent J. Lindbloom, DO  
Allen E. Nord, MD  
James E. Ryan, MD  
Julie C. Stevens, MD  
C. Roger Stoltz, MD  
Angelina L. Trujillo, MD  
Curtis H. Wait, MD  
Carol M. Zielike, MD  
Lew Papendick, MD  
Tom Reynolds, MD

A motion was made to accept Bylaw Amendment #1 with the following changes:



# South Dakota Foundation for Medical Care

## **More About The Health Care Quality Improvement Initiative SDFMC Plans For Implementing HCQII In South Dakota**

In July 1993, the South Dakota Foundation for Medical Care (SDFMC) began a new three year contract with the Health Care Financing Administration (HCFA) which will reshape the relationship between the SDFMC and South Dakota physicians and hospitals with a new program called the Health Care Quality Improvement Initiative (HCQII). When I discussed this last month, I emphasized that implementation of HCQII will allow SDFMC to shift its priority from identifying instances of poor care to identifying patterns of care and outcomes that can lead to systematic improvement.

During the next year, I and Stacy Bloemendaal, RN, my assistant clinical coordinator, with statistical expertise provided by Mary Cunningham, will be sharing data from pattern analysis with each South Dakota hospital's administrative and medical staffs.

We will plan to provide data about the patterns of medical care for individual hospitals and their physicians. The data may come from pattern analysis or case review analyses at both the hospital and statewide basis.

I am hopeful that most hospitals and physicians will be interested in outcome and quality data comparing "their hospital" with other hospitals of similar size in South Dakota. HCFA has provided SDFMC with a detailed Medicare claims database so pattern analysis can be accomplished. We also have access to the HCFA mortality analysis. We will share this data with you during our visits with you at your hospital.

It is very important that you know that this will be an educational and non-punitive program. To be most successful, this initiative requires feed back from you as South Dakota physicians. We want you to know that we are committed to helping you in any way we can, including the statistical analysis of Medicare claims data.

**If you have any ideas for statistical information that will be of help to you, please let us know.**

Bruce Lushbough, MD, MS  
Principal Clinical Coordinator  
South Dakota Foundation for Medical Care  
1323 South Minnesota Ave  
Sioux Falls, SD 57105  
Phone: (605) 336-3505

- 1) A typographical error in line 1 of number 1., commission duties to read "bearing" rather than "baring."
- 2) Number 3. be amended to read: "Monitoring the quality of CME within the state of South Dakota."

A motion was made to accept the Bylaw Amendment #2. The motion was seconded and carried.

A motion was made to accept the balance of the Report of the Reference Committee on Reports of the Commissions on Scientific Medicine; Internal Affairs, Communications and Liaison; and Professional Liability. The motion was seconded and carried.

Dr. David Smith read the Report of the Reference Committee on Reports of Special Committees and Miscellaneous Business.

#### REPORT OF THE REFERENCE COMMITTEE ON REPORTS OF SPECIAL COMMITTEES AND MISCELLANEOUS BUSINESS

The Reference Committee considered reports of the Budget and Audit Committee, the ShareCare Committee, the Grievance Commission, the South Dakota Political Action Committee, the Board of Directors of the South Dakota Medical School Endowment Association, the Physicians' HELP Committee, the Archives and History Commission and the AIDS Task Force and recommends approval of these reports.

The Reference Committee considered the report of the Medical-Legal Committee and recommends that the Medical-Legal Committee consider establishing a fee schedule for providing copies of medical records and if the committee is unable to establish such a fee that they be made aware this is a problem and some physicians have been threatened by attorneys regarding their charges for this service. With this recommendation the Reference Committee recommends acceptance of this report.

The Reference Committee considered Resolution #2 and unanimously recommends this resolution be rejected.

The Reference Committee considered Resolution #3 and by majority recommends this resolution be rejected.

The Reference Committee considered Resolution #4 and unanimously recommends adoption of this resolution with deletion of the second and third Whereas statements.

Respectfully submitted,  
REFERENCE COMMITTEE ON REPORTS  
OF SPECIAL COMMITTEES AND  
MISCELLANEOUS BUSINESS

David Smith, MD, Chairman

Paul Eckrich, MD

Stephen Haas, MD

Janet Smith, MD

R. Maclean Smith, MD

Karla Murphy, MD

Jeanne Bennett, MD

Aaron Shives, MD

Guy Tam, MD

Ronald Divine, Student

A motion was made to accept the recommendation of the Reference Committee on Reports of Special Committees and Miscellaneous Business to reject Resolution #2. The motion was seconded and carried.

A motion was made to accept the recommendation of the Reference Committee on Reports of Special Committees and Miscellaneous Business to reject Resolution #3. The motion was seconded and carried.

A motion was made to accept the recommendation of the Reference Committee on Reports of Special Committees and Miscellaneous Business to accept Resolution #4 with deletion of the second and third Whereas statements. The motion was seconded and carried.

A motion was made to accept the balance of the report of the Reference Committee on Reports of Special Committees and Miscellaneous Business. The motion was seconded and carried.

Dr. Thomas Krafka was installed as president of the South Dakota State Medical Association and briefly addressed the House of Delegates. The presidential address was followed by introduction of the new officers.

Dr. Barlow made an announcement to the House of Delegates concerning a request received from the MAAD Association in support of SB 674. This Bill requires health and safety messages during alcohol commercials and the MAAD Association requests contacts to Senator Pressler in support of SB 674.

There being no further business, the meeting adjourned at 10:35 am.

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## PRESIDENTIAL OATH OF OFFICE

I SOLEMNLY SWEAR THAT I shall carry out the duties of the President of the South Dakota State Medical Association to the best of my ability. I shall strive constantly to maintain the ethics of the medical profession and to promote the public health and welfare. I shall dedicate myself and my office to improving health standards and to the task of bringing increasingly improved medical care to the people of South Dakota. I shall uphold the Constitution and Bylaws of the AMA and the South Dakota State Medical Association. I shall champion the cause of freedom in medical practice and freedom for all my fellow Americans.

I do solemnly swear that I will discharge the duties of this office to the best of my ability, so help me God.

## REPORT OF THE PRESIDENT AND CHAIRMAN OF THE EXECUTIVE COMMISSION

This past year trips from Minneapolis to Los Angeles, Chicago to Nashville have been made on behalf of the South Dakota State Medical Association as well as all 12 districts. It has been a privilege and honor to represent you during this period.

In no other organization that I know of can a "First Name" bring about instant recognition. Everyone who has been a member of the association for any time at all recognizes who we are talking about when we say Bob, Jan, Jeri, Paul and Stephanie. These are common names belonging to very uncommon people. Many others are known by their first names that extend into other branches of the state's medical configuration such as the PRO, DAKOTACARE and the Board of Medical and Osteopathic Examiners.

So many people add their expertise to making the SDSMA run smoothly. Dedication to council and commission activity is the basis for our success. These non-compensated jobs have to be based on a love of the profession and a desire to maintain as much of the good things about it as possible for future generations.

The future of medicine as we know it today does not look good. Everyone should run for public office at least once if only for the benefit of becoming an instant expert on knowing how everyone else's business should be carried out. Hopefully I haven't become paranoid but it is necessary to learn where our friends and enemies are camped. Some of you are going to be shocked in the coming months, as to which are which.

On the national front, the delegate Bob Ferrell and alternate delegate Mike Pekas are our very capable representatives. Bob Ferrell was elected chairman of the North Central District this past year and did a great job which should make us all proud.

My main objective this year was to stimulate physician involvement, especially the younger physicians. This is a never-ending job and can never be called a success.

I, like all presidents before me, would like to thank Bob Johnson. He has had to put up with my opinionated ways and similar lack of political grace on many long trips. Thanks again to all of you for this opportunity and rest assured the Association will be in good hands with Dr. Krafka.

Respectfully submitted,  
M. George Thompson, DO  
President

*The Reference Committee reviewed the report of the President and Chairman of the Executive Commission and recommended it be accepted as submitted.*

## REPORT OF THE PRESIDENT ELECT

In addition to President-Elect, I am also the SDSMA representative on the Governor's Health Care Commission. Our Commission looked at and recommended passage of the following bills in the '93 legislative session:

- SB93 Appropriated money for family practice residency including start-up funds for Rapid City
- SB94 Appropriated funds for tuition reimbursement
- HB1095 Defined a rural primary care hospital
- HB1096 Established a health care data collection system
- HB1098 Continued nursing home moratorium
- HB1099 Appropriated money for certain emergency medical services
- HB1100 Allows for generic drug substitution (similar to present Medicaid system)
- HB1162 Health insurance reform

All except HB1162 were passed. HB1162 was amended (gutted) and eventually was vetoed by Governor Mickelson.

Nationally, I have been watching and learning about Health Care Reform including two trips to D.C. This is the report I submitted to the Council April 1.

*The White House Task Force is made up mostly of academics, federal employees and Democratic Congressional staffers. The 50 or 60 physicians advertised to be on the task force do not represent physician organizations and all or almost all are salaried.*

The Task Force will have a plan May 3 and an attempt will be made (probably) to shove it through Congress unchanged (like the economic plan). The Republican leadership think they can hold it up in the Senate.

It will have "Managed Competition" as its theme and probably will include Global Budgets which will be phased in over 3-5 years along with universal coverage. There will be some sort of price controls for the short term (maybe "voluntary" freezes). Washington will define the minimum benefit package and develop a framework for liability reform as well as probably mandate Community rating, FTC relaxation, Erisa changes and changes in taxation of medical benefits.

States will be responsible for developing HIPC's (Health Insurance Purchasing Cooperatives) -- only one in South Dakota -- which will assist individuals and small groups purchase insurance. State, county and local government employees will also purchase insurance through the HIPC. Medicaid will be rolled into the HIPC, maybe gradually. The status of Medicare, IHS, VA, etc., is still unclear. States will also have to make rules to govern the HIPC's activities and how it relates to insurance companies and providers.

Providers will have to either immediately or gradually form networks to negotiate and contract with either the HIPC or insurance companies. This network will also be necessary to provide accountability mandated by Washington. This may be through HMO, PPO or modified fee for service arrangements.

At this time there is probably nothing to do except contact Senators Daschle and Pressler and Congressman Johnson

and urge them not to pass any program until there has been adequate public scrutiny. You might want to encourage your patients to do the same.

Since April 1, the May 3 date has been relaxed to the end of May and the successful Republican filibuster of the President's economic stimulus package raises serious doubts about the ability to pass a comprehensive reform package.

Respectfully submitted,  
Thomas L. Krafska, MD  
President-Elect

*The Reference Committee reviewed the report of the President Elect and recommended it be accepted as submitted.*

#### REPORT OF THE VICE PRESIDENT

This year can best be described as one of waiting with anticipation for the changes in health care that will be advocated by the National Task Force. The goal of the State Medical Association is to maintain, for the physicians of South Dakota, the most advantageous position in these changing times. Whether the recommendations will involve a capitation system, a single payor system, or another type of high-bred system, physicians will be forced to change their practice arrangements as they have never been asked to do before. The South Dakota State Medical Association can provide a forum through which physicians of South Dakota can be heard individually and as an association to impact the health care delivery system locally and in South Dakota. Clearly, a difference can be made and our voices will be heard, both at the state and national level.

Respectfully submitted,  
James R. Reynolds, MD  
Vice President

*The Reference Committee reviewed the report of the Vice President and recommended it be accepted as submitted*

#### REPORT OF THE SECRETARY-TREASURER

This has been an exciting year in the Medical Association. The increased representation on the Council for the smaller districts approved last year at the State Meeting has had a positive effect.

We are pursuing investigation into increasing availability for locum tenens services for rural practitioners. I'm excited about the interest shown around the state by people involved in this project and I appreciate everyone's hard work and enthusiasm. I think the availability of locum tenens services is important in rural health care.

The Young Physicians Section continues to be an active force in the South Dakota State Medical Association. We need to continue to encourage these people in their leadership efforts.

Respectfully submitted,  
Mary S. Carpenter, MD, FFAFP  
Secretary-Treasurer

*The Reference Committee reviewed the report of the Secretary-Treasurer and recommended it be accepted as submitted.*

#### REPORT OF THE CHAIRMAN OF THE COUNCIL

It has been my distinct pleasure and privilege to serve as your Council Chairman for a second year. The Council has discharged its responsibilities in directing the activities of the South Dakota State Medical Association with due deliberation and in concert with the membership.

Officers elected and Councilors seated during the year include:

|                         |  |
|-------------------------|--|
| Chairman of the Council | James Engelbrecht, MD  |
| Secretary-Treasurer     | Mary Carpenter, MD   |
| Seated Councilors       | Thomas Huber, MD, Pierre<br>Gregg Tobin, MD, Rosebud<br>Ben Henderson, DO, Northwest<br>Stephen Gehring, MD, Watertown<br>Rick Holm, MD, Madison/<br>Brookings<br>Curtis Buchholz, MD, Huron<br>Howard Saylor, MD, Huron<br>Richard Kafka, MD, Rosebud |

The Council considered and took action as follows:

The need for locum tenens service for rural physicians was evaluated by survey. Discussions regarding implementation of this type of program continue and a final report to the SDSMA membership will be made in the summer.

In conjunction with the Young Physicians Section, the annual "Young at Heart" Award was developed to honor a physician who has been a role model and particularly helpful to the young physicians in South Dakota.

The Council reviewed the request by North Dakota Blue Cross/Blue Shield to develop a Medicare Advisory Committee. After extensive discussion and deliberation the Council decided it could not in good conscience participate in this committee. Specific stipulations were placed on future considerations for participation including having a representative from the Medicare Denver Regional Office as well as a staff representative from one of our congressional offices be present at all meetings. We also formally communicated our reasons for not participating in this committee with our congressional delegations as well as other state medical associations involved with North Dakota Blue Cross/Blue Shield.

The Council supported the resolution by the Young Physicians Section to ask Congress to repeal the law discounting reimbursement to young physicians.

An annual "Media Award" was established to recognize excellence in reporting of medical issues.

Dr. Tom Krafska was nominated to the South Dakota Advisory Committee on Health Care. Dr. Krafska was placed on this committee working closely with Governor Mickelson and Secretary of Health, Barb Smith. Dr. Krafska has presented timely reports to the Council for further input and deliberation.

Reviewed and accepted the report of the Commission on Professional Liability, Commission on Scientific Medicine, Commission on Medical Service, a joint meeting of the Executive Commission and the Hospital Association Board of Trustees, the Budget and Audit Committee with a proposed budget for 1993-94, the Medical-Legal Committee and the Commission on Legislation which established the 1993 legislative agenda and the CME Committee. Accepted the report of the Commission on Internal Affairs which worked with Lawrence and Schiller to produce six public relations brochures for physician offices, and to determine what business arrangement will continue with SDSMA and Lawrence and Schiller Marketing.

The Council received a response from Senator Daschle regarding his health care reform proposal and the SDSMA's concerns and recommendations.



Reports were received on the South Dakota Drug Advisory Board mandated by OBRA, and this continues to be monitored by Dr. Richard Holm and Dr. Bruce Lushbough.

A resolution adopted by the 1992 House of Delegates regarding the allocation of financing for long-term care as a health care expense was submitted to the North Central Medical Conference for consideration.

Discussion was held on a mission statement for SDSMA and this will be considered further at the June meeting.

HIV/health care worker guidelines for South Dakota as prepared by the Health Department were reviewed and comments forwarded to the Department.

The Council denied a request for financial support from Colorado Personalized Education for Physicians inasmuch as South Dakota will work with the North Central states.

A MADD victims handbook submitted by the Black Hills District Auxiliary was submitted to the Medical-Legal Committee for review.

Nominations for the Distinguished Service and Community Service awards were received, ballots cast, and recipients will be announced at the 1993 annual meeting banquet.

A bylaw amendment will be submitted to the 1993 House of Delegates encouraging continuing medical education but not requiring a random audit of the membership. The Council submitted recommendations to the Department of Social Services regarding the allocation of additional Medicaid funds.

Recommendations were approved to encourage student membership in SDSMA. Also, changes were made in the application form for active and associate members. Physicians elected to honorary life membership during the year include:

T. H. Sattler, MD, Yankton  
Lloyd Sweeney, MD, Sioux Falls  
Michael Ferrell, MD, Sioux Falls  
R. D. Bloemendaal, MD, Rapid City  
Wenzel Kovarik, MD, Rapid City  
H. Phil Gross, MD, Sioux Falls  
Robert Giebink, MD, Sioux Falls  
Richard Kovarik, MD, Rapid City  
David Yecha, MD, Northwest  
Harold Fletcher, MD, Vermillion  
Ed James, MD, Rapid City

With extreme gratitude I would like to acknowledge the administrative assistance of Donna Sievers, Jan Anderson and Bob Johnson in all our Council activities.

Respectfully submitted,

James Engelbrecht, MD  
Chairman of the Council

*The Reference Committee reviewed the report of the Chairman of the Council and recommended it be accepted as submitted.*

#### REPORT OF THE AMA DELEGATE

Thank you again for the privilege of serving in the American Medical Association House as your delegate. The annual meeting was held as usual in Chicago in June and

the interim meeting in Nashville in December. I attended both as delegate and Mike Pekas did so as your alternate delegate. George Thompson and Bob Johnson attended in their respective capacities as president and executive officer of the association. Difficulty of the material to be discussed and voted upon was aided in great part by having George as a willing participant in testifying in support of the resolutions proposed by the South Dakota State Medical Association.

I continue to be impressed with the vigor, intelligence, and conscientiousness with which the best interests of our profession are being pursued by the AMA, despite the fact that the present administration has essentially locked out any participation in the Health Reform Task Force which is meeting behind closed doors. We can be assured that when the opportunity is presented to give testimony on what is best for our patients in the health care reforms being demanded by this administration, the AMA will be there. During this period of time you can count on continued character assassination, organized cheating by the federal government, as well as continued over-regulation; but, regardless of the rumors of what is coming down in the form of these new health care programs, the AMA is the only logical choice to represent our interests. All of the other organizations in medicine do not represent enough people to have the strength to act on our behalf.

Detailed reports of the actions of both House of Delegates meetings have been sent to you under separate cover. Now more than ever we need to continue our support of the AMA. Because, with the rumors of how health care reform is to be undertaken, there will be organizations that will be assigned the responsibility of disbursing finite funds for an entire illness for a patient; and, as you know, if that is done in the form of national conglomerates (being formed for that special purpose), the physician is going to be on the bottom of that "vertical integration."

The AMA has not abandoned Health Access America as an efficient means of presenting access to quality medical care for all Americans. This continues to be our primary and overriding concern. It is also even more important to remain alert to the fact that we are still the patients only true advocate. While carrying out this responsibility is being made even more and more difficult by outside interference, we are still part of the best profession in the world.

Respectfully submitted,

Robert L. Ferrell, MD  
AMA Delegate

*The Reference Committee reviewed the report of the AMA Delegate and recommended it be accepted as submitted.*

#### REPORT OF THE AMA ALTERNATE DELEGATE

As your alternate delegate to the AMA last year, I attended the AMA annual meeting in June in Chicago and the interim meeting this past December in Nashville. The American Medical Association and its federation of state medical societies and associations continues to act for the general welfare and benefit of the physicians and their patients in this country. Health care reform continues on the "fast track" within the executive branch of our government and the AMA is becoming more and more involved in helping to fashion a meaningful and rational health care plan.

I have attended all of the council and executive commission meetings during this past year and I have been involved in all of the activities and projects of the state medical association as requested.

I look forward to continuing to serve you in this position. Please feel free to contact me at any time concerning your views with regard to organized medicine so that I can better represent you in the North Central Medical Conference and the American Medical Association.

Respectfully submitted,

Michael W. Pekas, MD  
AMA Alternate Delegate

*The Reference Committee reviewed the report of the AMA Alternate Delegate and recommended it be accepted as submitted.*

#### REPORT OF THE SPEAKER OF THE HOUSE

As your newly elected Speaker of the House of Delegates, I am looking forward to serving you in that capacity at our annual meeting in June. The House functions as the forum for our association and this year's meeting promises to have a number of important issues that need discussion.

Reference Committees will be hearing testimony and need the involvement of individual physicians to form their reports. I strongly urge you to take part in this year's meeting, and would be happy to help assist you in the introduction of any resolutions for the House of Delegates.

Respectfully submitted,

Stephan D. Schroeder, MD  
Speaker of the House

*The Reference Committee reviewed the report of the Speaker of the House and recommended it be accepted as submitted.*

#### REPORT OF THE COUNCILOR AT LARGE

Over the past year as Councilor at Large, I was privileged to attend the meetings of the Executive Commission, the House of Delegates, and the Council. I am grateful for the continuing opportunity to serve our organization in my capacity as Councilor at Large. There seems to be a never ending series of new problems which face organized medicine and it is certainly incumbent on all of us to remain vigilant and meet the challenges with which we are presented daily. I have thoroughly enjoyed my years in the Association as both a member and officer and will continue to maintain an interest in the functions and activities of the State Medical Association. I hope to be able to participate in any way deemed appropriate by the membership. I am most grateful to the members of our organization for the excellent leadership which our organization enjoys and for all of the help and support that I have received from the membership at large and from the administration of the State Medical Association over the past many years. Quoted from J. A. Eckrich, MD, Councilor at Large, Delegate's Handbook 1992.

(I have always said there is no higher privilege than to be quoted. Dr. Eckrich has not only said it all but man in his infinite wisdom is a lazy creature at best. Have a fine day!

Respectfully submitted,

Richard I. Porter, MD  
Councilor at Large

*The Reference Committee reviewed the report of the Councilor at Large and recommended it be accepted as submitted.*

#### REPORT OF THE CHIEF EXECUTIVE OFFICER

This past year has been filled with many truly exciting happenings in the area of health care. Let me first say that Dr. Thompson and I enjoyed very much the opportunity to meet with each of the district medical societies during the course of the year. We found the conversation both stimulating and informative and would encourage our districts to continue their efforts to increase attendance on the part of their members at their regular meetings, since it may be the single most effective way of transmitting very important and sensitive information to the membership as health care reforms are unveiled.

A great deal of speculation surrounds the unveiling of the Clinton Administration's health plan, and at the writing of this report, there is no concrete blueprint which I would point to as containing information that would be reliable.

We are told that the task force is rapidly completing its tasks and speculation on Capitol Hill ranges from adoption of a plan by year end 1993 to passage of a plan over a period of several years. In any respect, it is imperative that all physicians carefully review the impact that health care reform will have on your individual practices and on your patients.

It appears that there may be many new configurations within medicine in the near future: health alliances; approved health plans; direct contracts with large employers; and extension of the current fee-for-service programs which are most familiar. We would urge the membership to carefully review any contracts that may be submitted to them for their signature. We would caution the membership against signing exclusive contracts since in the future such contracts could preclude your right to see many of your current patients.

I have recognized for years that paperwork and contracts are often the most undesirable part of the medical practice for physicians. However, at no time in the past has it been as important as it will be now to carefully review your options and keep as many doors open as possible. Such policies are often restricted in the fine print of contracts.

The American public and elected politicians seem intent on changing at least certain provisions within our current system. I think we would all agree that there are areas where change is truly needed. I would like to hope that the politicians and public will keep and improve those parts of our system which have made the American health care system the envy of the rest of the world.

You can be certain that 1993 will require increased communication by organized medicine at all levels. Let me assure you that your executive office will do everything possible to make sure that all physicians are kept well informed.

The members of the Medical Association's Commissions, the Council, and our special Committees deserve a special thanks. They have worked throughout the entire year with no compensation other than the reward received for working on behalf of the profession and the public at this most critical time. I salute the unselfish giving of their time and their talents.

To your President, Dr. George Thompson, whom I consider a personal friend, a special word of thanks. Your commitment to the American dream, American medicine, South Dakota physicians, and the South Dakota public in



general is without compare. You have truly provided outstanding leadership during this very unsettled time. Thank you for a job well done.

Respectfully submitted,

Robert D. Johnson  
Chief Executive Officer

*The Reference Committee reviewed the report of the Chief Executive Officer and recommended it be accepted as submitted.*

#### REPORT OF THE FIRST DISTRICT COUNCILOR

Except for the usual summer recess the First District Medical Society met monthly on the first Wednesday. Each meeting consisted of dinner with our spouses, a business meeting, and scientific session. Several were generously sponsored by our friends in the pharmaceutical industry.

Our March meeting was attended by State Association president George Thompson, DO, and Chief Executive Officer Bob Johnson. We were especially honored by the presence of their charming wives.

With the addition of a number of new staff physicians, but especially by diligent efforts of secretary Winston B. Odland, MD, increasing active membership has proceeded apace.

Officers for 1993 are: Dr. Alex Falk, President, Dr. M. Holte, Vice President, Dr. Winston Odland, Secretary, Dr. Jim Hovland, Councilor 1993-96, Dr. Reid Holkesvik, Alternate Councilor. Dr. John Vidoloff has been nominated to the South Dakota Foundation for Medical Care.

Our goal is to restore collegiality among physicians which has been notably and regrettably diminished in recent years locally, statewide, and nationally.

We realize that without our diligent devoted auxiliary we would probably cease to exist as a group. Guest speakers at their meetings included Ruth Parry, Sioux Falls, SDSMA Auxiliary president and Mollie O. Krafka, Rapid City, member of the AMA Auxiliary Health Promotion Committee. For seven years members have manned a booth at Winterfest and baked gourmet chocolate brownies. Approximately \$800 has been raised each year and donated to a local designated charity. The AMA-ERF Christmas card to all district physicians and spouses has grossed between \$3500-\$4000 the last few years. Funds go to the USD School of Medicine.

Respectfully submitted,

James I. Hovland, MD  
First District Councilor

*The Reference Committee reviewed the report of the First District Councilors and recommended it be accepted as submitted.*

#### REPORT OF THE SECOND DISTRICT COUNCILORS

Since our last annual meeting, the Watertown District Medical Society met in September which was a social meeting with spouses as the introductory meeting for the coming year. In October a program was cancelled but we had our regular monthly meeting.

On November 3, 1992, we had our regular monthly meeting. This meeting adjourned fairly early so the members of the District could get the election results.

On December 8, 1992, we had our regular monthly meeting, and we invited all the legislators to meet with the District Medical Society physicians. Present were Randy Frederick, Republican Senator from Hayti; Joyce Hodges, Republican

Representative from Lake Preston; Lee Van Sickle, Democratic Representative from Watertown; Doug Bierschbach, Republican Senator from DeSmet; Thomas Ries, Republican Representative from Watertown; and Dale Howlett, Democratic Senator from Codington County. A very interesting open discussion was held with these legislators concerning Family Practice Residency, Rural Training Track Program in Watertown, the story about Dr. Swango and comments made by physicians that this was not a significant problem at the University of South Dakota or at the Residency Programs, that it was only one unfortunate incident that occurred.

Election of officers took place and the following were nominated and approved:

|                       |                       |
|-----------------------|-----------------------|
| President             | - Ken Rogotzke, DO    |
| Vice President        | - Ken Peterson, MD    |
| Secretary             | - Gerald Tracy, MD    |
| Delegate for 3 years  | - Roger Carter, MD    |
| Alternate Delegate    | - Gary Timmerman, MD  |
| Delegate for 2 years  | - Aaron Shives, MD    |
| Alternate Delegate    | - Jim Jones, MD       |
| Delegate for one year | - Steve Feeney, MD    |
| Alternate Delegate    | - Gerald Tracy, MD    |
| District 2 Councilor  | - Jim Larson, MD      |
| Alternate Delegate    | - Ken Peterson, MD    |
| Second Councilor      | - Stephen Gehring, MD |
| Alternate Delegate    | - Ken Johnson, MD     |

The January, 1993 meeting consisted of a program presented by Mr. Paul Hinderaker who gave a presentation on "Sexual Harassment in the Work Place" particularly with reference to the hospitals.

The February meeting was held with visitation from the president of the State Medical Association, Dr. George Thompson, accompanied by Mr. Robert Johnson. He reported on the legislative process and the status of current bills and gave an update with reference to DAKOTACARE and the South Dakota Medical School Endowment Association.

The March, 1993 meeting was highlighted by a brief program from Social Services regarding the Council on Aging Service Seminar to be held this summer, and by Dr. Charles Sherman who was the new head of the Human Services Agency in Watertown, and Ron Bassman from the Lake Region Mental Health Center. They gave an overview of the elements of the Human Services Agency including the Alcohol and Drug Treatment and Referral Center, Lake Region Mental Health and the Adjustment Training Center.

Our April meeting consisted of a program from Mr. David Christensen from the Medicaid Department of the State Department of Health who presented a pilot program suggesting the Watertown District Medical Society become involved with the pilot program which would encompass a gatekeeper concept to manage Medicaid patients within the Watertown District area. He presented a handout on primary care case management. There were many questions asked and before the conclusion of the meeting it was decided to appoint a committee to meet with him when he had more particular details to present to us.

Respectfully submitted,

James C. Larson, MD

Stephen H. Gehring, MD  
Second District Councilors

*The Reference Committee reviewed the report of the Second District Councilors and recommended it be accepted as submitted.*

REPORT OF THE THIRD DISTRICT COUNCILOR

This district has continued its regular meetings during 1992. The meeting in February was held in Brookings. Dr. Tad Jacobs and Dr. Rick Holm were elected as delegates to the state medical meeting in June. Dr. Curtis Wait will continue serving in his capacity as Councilor and on the nominating committee. A lecture by Dr. Jose Teixeira on internal pacing was provided.

The District met again on April 16, 1992, in Brookings. Mark Amundson, a physical therapist from Brookings, provided an interesting program on advances in physical therapy.

The third meeting of the year was held on June 18 in Brookings. Dr. Rick Holm announced the Third District would qualify for an additional councilor and he was elected to that position. The educational meeting regarded office requirements for a medical practice.

The meeting of August 20 was held in the cabin of Dr. Merritt and Pam Warren. No official business was conducted and dinner was catered by the Marriott Food Services.

The meeting in October was held in Brookings. Dr. Dan Cecil and Dr. Faith Sarfarazi were presented for membership of the Third District. A video was viewed discussing various presidential candidates' plans for general health care funding and general discussion regarding this followed.

The final meeting of the year was held in Flandreau in December. An update on what was occurring at the State Medical Association was delivered by Bob Johnson. New services projects were discussed. The election of officers was held and Dr. Gary Bruning was elected as President, Dr. Adel Hassan as Treasurer, and Dr. Merritt Warren as Vice President.

Respectfully submitted,

Curtis Wait, MD

Third District Councilor

*The Reference Committee reviewed the report of the Third District Councilors and recommended it be accepted as submitted.*

REPORT OF THE FOURTH DISTRICT COUNCILORS

The Fourth District Medical Society held their annual meeting in January, 1993.

The business portion of the meeting was devoted to a general discussion of the impact of the upcoming governmental changes anticipated. Officers elected included: Dr. B. J. Lindbloom as President, Dr. R. J. Owens as Vice President and Dr. Eldon R. Becker as Secretary-Treasurer. Dr. Phillip Hoffsten and Dr. Tom Huber serve as councilors from the Fourth District. Delegates for 1993 include Dr. B. J. Lindbloom and Dr. Ken A. Bartholomew. The nominating committee member is Dr. Phillip Hoffsten. Alternate delegates were Dr. Eldon Becker and Dr. Buron O. Lindbloom. The Fourth District Medical Society in conjunction with the Continuing Education Department of St. Mary's Hospital sponsored the following CME programs:

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January 21, 1992

Antibiotic Usage: A Different View.,  
Dr. T. L. Luzier.

April 21, 1992

Post Infarct Angina. Dr. R. H. Allen.

May 12, 1992

Appropriate Dosing of Antibiotics in  
the Hospital. M. G. Duncan.

May 19, 1992

NHLBI Guidelines on Management  
of Asthma. Dr. T. L. Luzier.

September 15, 1992

Diagnosis of Hyperlipidemia. Dr.  
Stephen Haas.

November 17, 1992

Antimicrobial Update. Dr. J. M.  
Keegan.

The membership in the Fourth District Society was increased by two physicians in the past year. Dr. Rodney Vizcarra, a general surgeon, and his wife, Dr. Dale Vizcarra, a family practitioner, moved to Pierre in the summer of 1992 and joined Medical Associates Clinic. The staff at St. Mary's Hospital in Pierre, now numbers eighteen active members.

Respectfully submitted,

P. E. Hoffsten, MD

Tom Huber, MD

Fourth District Councilors

*The Reference Committee reviewed the report of the Fourth District Councilors and recommended it be accepted as submitted.*



## REPORT OF THE FIFTH DISTRICT COUNCILOR

During the course of 1992-1993 the Society continued to have at least quarterly business meetings, as well as educational sessions interspersed. The District increased its membership by seven new members and one transfer from Sioux Falls.

The president of the State Medical Association. Dr. George Thompson, as well as Robert D. Johnson and Dr. Russell Harris were present for the District meeting on April 14, 1993.

Due to the new membership, as well as available monies in the treasury, it was decided that the principal towns; Huron, Wessington Springs, Miller and DeSmet, should each receive \$2500 to be utilized in those towns for what is deemed to be the most needed for those individual communities as decided by the physicians in those communities.

Appropriate physicians were assigned to Doctor of the Day, as well as appropriate representation in the additional needed state functions.

The next scheduled quarterly meeting will be in July.

Respectfully submitted,

Knute Landreth, MD  
Fifth District Councilor

*The Reference Committee reviewed the report of the Fifth District Councilor and recommended it be accepted as submitted*

## REPORT OF THE SIXTH DISTRICT COUNCILORS

The Sixth District Medical Society has met several times since the last report.

On April 23, 1992, Dr. Phillip Hoffsten from Pierre lectured on "Estrogen Replacement Therapy." May 21, 1992, Dr. Robert Raszkowski spoke on "Antibiotic Induced Colitis." On July 23, 1992, Dr. Galen Vonk spoke on the subject of endometriosis. Dr. Brian Hurley was present at the September 24, 1992, meeting and presented a program regarding "Management of COPD." President of the SDSMA, Dr. George Thompson and Mr. Robert Johnson, CEO of SDSMA, were present at the March 24, 1993, meeting and presented a program entitled "Psychiatric Issues and Depression."

New members accepted into the district during the past year include Dr. Douglas Holum and Dr. Dennis Leland, both from Mitchell.

District officers elected for 1993 are: Patricia Malters, MD, president, Ron Anderson, MD, vice-president, Jerome Howe, MD, secretary-treasurer.

Respectfully submitted,

Walter P. Baas, MD  
Lucio Margallo, MD  
Sixth District Councilors

*The Reference Committee reviewed the report of the Sixth District Councilors and recommended it be accepted as submitted.*

## REPORT OF THE SEVENTH DISTRICT COUNCILORS

The Seventh District Medical Society meets the first Tuesday of every month at 6:30 p.m. from September through May at the Westward Ho Country Club in Sioux Falls. All South Dakota State Medical Association members

are welcome at the meetings as guests. The current officers of Seventh District Medical Society are Robert VanDemark, Jr., MD, president; Daniel Blue, MD, president-elect; Karla Murphy, MD., secretary, and Laura Larsen, MD, treasurer. Dr. John Sall is the past president of this district and was recognized in January 1993 for his contributions to the District Medical Society. The Executive Committee consisting of Robert VanDemark, Jr., MD, Daniel Blue, MD, Karla Murphy, MD, Laura Larsen, MD, John Sall, MD, Robert Raszkowski, MD, Daniel Kennelly, MD, C. Roger Stoltz, MD, Rodney R. Parry, MD, Guy Tam, MD, Lowell Hyland, MD, Gene Koob, MD, James Reynolds, MD, Jeffrey Hagen, MD, and Michael Pekas, MD meets monthly to arrange programs for the district and conduct business as needed.

In September, Robert Talley, MD presented the annual report of the status of the Medical School. He stressed that there were over 1600 applications for the current freshman class of 50 students, of which 27 are women. He felt the quality of the applicants including those from South Dakota was exceptional. He also reported that the physical therapy and occupational therapy programs were underway and plans were being laid for the physician assistant program authorized by the state legislature. In addition, he described the construction of the new building to house the faculty in Sioux Falls and his vision of a health science library to serve South Dakota.

The December meeting is traditionally a joint dinner with the area legislators, physicians' spouses, physicians and other interested individuals. This year the event was used to outline "Health Access America" and review the history of chelation from the physician's standpoint. Drs. Jim Reynolds and Michael Pekas were the presenters. The membership is encouraged to maintain dialogue with representatives throughout the year.

The programs for the monthly meeting highlighted a variety of topics throughout the year. Dr. Pete Travers shared his insight of his tour of duty as a medical officer involved in Operation Desert Shield and Desert Storm. Dr. Paul Kuck reported from the North Central Conference Young Physicians meeting and Dr. Angelina Trujillo presented an overview of the AMA focus on "Women in Medicine". RoAnn Redlin and Dr. Patricia Giebank discussed the proposed legislation on sexual abuse of patients. Professor Michael Myers of the University of South Dakota School of Law discussed "Physician Control of Ambulatory Care" in a changing medical milieu.

In March 1993, the annual presidential visit was made by George Thompson, DO and Executive Director Robert Johnson. Dr. Thompson outlined the status of the bills in the legislature and shared his insight regarding current practice issues in South Dakota.

A special visitor to the Medical Society and the University of South Dakota School of Medicine was Dr. Robert McAfee, trustee of the American Medical Association. Although his visit was not during one of our regular meetings, he was able to interact with a variety of audiences including the Execu-

tive Committee of the Seventh District, the State Medical Association staff, faculty, medical students and the press. Dr. Robert Ferrell, AMA delegate from Rapid City, Dr. George Thompson, president of the South Dakota Medical Association, were able to join Dr. McAfee for an evening reception. Dr. McAfee presented Internal Medicine Grand Rounds titled "Interpersonal Family Violence: Is This a Medical Problem".

The Seventh District Medical Society is especially pleased with the creativity and enthusiasm demonstrated by the Seventh District Auxiliary in arranging the Pills vs. the Drills basketball game. The revenue from this event is slated for the purchase of athletic equipment for the Children's Home Society gymnasium. Despite the need for ace bandages, meter dose inhalers and liniment, the game is always a great success.

Respectfully submitted,  
Rodney Parry, MD  
Robert Raszowski, MD  
Jeffrey Hagen, MD  
C. Roger Stoltz, MD  
K. Gene Koob, MD  
Guy Tam, MD  
Lowell Hyland, MD  
Daniel Kennelly, MD  
Seventh District Councilors

*The Reference Committee reviewed the report of the Seventh District Councilors and recommended it be accepted as submitted*

#### REPORT OF THE EIGHTH DISTRICT COUNCILOR

The Eighth District Medical Society met four times in the past year on July 28, January 19, October 14 and April 22. Usual business was conducted and several new memberships were approved during the year. Dr. Ted Sattler was honored with life membership to the South Dakota State Medical Association. New members at the July meeting included: Rudolf Loperena, MD, of Wagner, Scott Weber, DO of Wagner and Victoria Gerhart, MD from Dakota Dunes.

At the October 1992 meeting, Dr. Willis Stanage was nominated for the State Medical Association's Distinguished Service Award. Doctor of the Day program was presented and open dates were attempted to be filled with District 8 members. Nominating committee was appointed for 1993 elections. Dr. Ralph Samlowski was elected to new membership.

The January 1993 meeting was held at the Black Steer Restaurant. Legislative key contacts were appointed and nominations for officers for the following year were presented. President, Dr. Jim Wiggs; Vice President, Dr. Jem Hof; Secretary-Treasurer, Dr. Dan Megard. Delegates are Dr. Jem Hof, Dr. David Smith, Dr. Duane Reaney and Dr. Julie Stevens. Remaining alternate positions were open.

The final meeting of the year was held in April, 1992 and minutes were not available but the district was visited by Robert Johnson, Chief Executive Officer and Dr. George Thompson, State Association President, with information and discussion regarding potential for managed care in the state of South Dakota. This concluded the business of the District 8 Medical Society for this year.

Respectively Submitted,  
Larry A. Meyer, M.D.

Eighth District Councilor

*The Reference Committee reviewed the report of the Eighth District Councilors and recommended it be accepted as submitted.*

#### REPORT OF THE NINTH DISTRICT COUNCILORS

The Black Hills District Medical Society remains very active in legislative issues this year. A legislative committee was organized by Dr. John Barlow. We held a social dinner with our state congressional candidates in October and our third annual Crackerbarrel Session with the legislators is scheduled for April. We feel these meetings have been instrumental in improving our relationship with our representatives and in keeping abreast of the issues throughout the year. Dr. Engelbrecht and Dr. Krafka have informed us of issues at our regular meetings.

This was a growth year for our membership. Black Hills District has added another 20 new members to our roster, however, we mourn the loss of Dr. Warren Reinoehl from Custer who passed away in October.

During our regular meetings, our programs have included discussions on organized medicine by Dr. Krafka and Dr. Engelbrecht, and on practice management by Dr. Goodhope. The unique problems of medical marriages was also discussed by a licensed psychologist in a joint meeting held between the Black Hills District Medical Society as well as the Medical Alliance.

The Medical Alliance has remained an inspiration for us all. It has helped us greatly in the legislative efforts and continues to help us in our charitable events. Medical Alliance has maintained active membership in Mothers Against Drunk Driving and has helped us make a significant donation to the Children's Miracle Network in February.

We had a combined effort between the Medical Auxiliary and Medical Alliance and the Pennington County Bar Association to provide another Jawbones vs. Sawbones basketball game this year which had great attendance and provided \$3,000 toward our local United Way effort. Dr. Cynthia Weaver is our president-elect for 1993-94.

Respectfully submitted,

Carol Zielike, MD  
Stephen Haas, MD  
Richard Renka, MD  
Geoffrey Slingsby, MD  
James Engelbrecht, MD  
Councilors, Ninth District

*The Reference Committee reviewed the report of the Ninth District Councilors and recommended it be accepted as submitted.*

#### REPORT OF THE TENTH DISTRICT COUNCILOR

As District 10 councilor I am submitting this as an update of our district medical meetings. The meeting this year was held in Winner after an initial delay due to blizzard conditions. Bob Johnson and Dr. Thompson attended the meeting with the following Winner and Gregory physicians attending: Drs. Andrew Clark, Richard Kafka, Eugene Bolliger, John Malm, Tony Berg, Mary Carpenter, Robert Stiehl, and Gregg Tobin.

The principal discussions at the meeting were with regard to the current legislative concerns in the state and the medical association's position. There was also a discussion about rural health coverage and the ongoing work by the State Medical Association, the Office of Rural Health and the State Health Department. There was general support from a majority of members present with the State Medical Association's position.



The district medical society welcomes the addition of Dr. Pat Mitchel at Burke. He also attended the meeting and is in the process of joining the local and state medical associations.

The election of officers was held and the results were as follows: Robert Stiehl, MD, president; Edwin Sweet, MD, vice-president; Gregg Tobin, treasurer. Council members elected were Richard Kafka, MD and Gregg Tobin, MD with John Malm, MD being elected as delegate.

The next annual medical meeting will be planned and coordinated with the attendance of Mr. Johnson and the president of the State Medical Association.

Respectfully submitted,

Gregg M. Tobin, MD  
Tenth District Councilor

*The Reference Committee reviewed the report of the Tenth District Councilor and recommended it be accepted as submitted.*

#### REPORT OF THE ELEVENTH DISTRICT COUNCILOR

During the past year we took in two members, Drs. Chris Hugo, surgeon, and Douglas Prochaska, family practitioner, at the Mobridge Medical Clinic. In January we met with the president of the South Dakota State Medical Association.

The election of officers are as follows: Ben Henderson, DO, president; J. D. Collins, MD, vice-president; Leonard M. Linde, MD, secretary; James Collins, MD, councilor; Ben Henderson, DO, councilor. No one is available to serve in the capacity of delegate.

Respectfully submitted,

Ben Henderson, DO  
Councilor, Eleventh District

*The Reference Committee reviewed the report of the Eleventh District Councilor and recommended it be accepted as submitted*

#### REPORT OF THE TWELFTH DISTRICT COUNCILOR

The Whetstone Valley District Medical Society had its customary three meetings in the 1992-1993 year. The spring meeting was held in Webster and consisted of a scientific program. The fall meeting was held in Milhank and included a scientific program and a business meeting. The summer meeting was held at the home of Dr. Joseph Kass in Rosholt. Mr. Bob Johnson and Dr. Thompson, president of the South Dakota State Medical Association, were on hand to give an update on Medical Association affairs.

Newly elected officers for the 1993-1994 year include:

Alan Bloom, M.D., Webster - President

Lawrence Nelson, M.D., Webster - Vice President

Kevin Bjordahl, M.D., Webster - Secretary

Kevin Bjordahl, MD, Webster - Annual Meeting Delegate

Dr. Kevin Bjordahl, Webster, is the current councilor from the Twelfth District, and has one year remaining on his term. Dr. Alan Bloom was nominated for the second councilor seat for the Twelfth District.

Respectfully submitted,

K. L. Bjordahl, MD  
Twelfth District Councilor

*The Reference Committee reviewed the report of the Twelfth District Councilor and recommended it be accepted as submitted.*

# South Dakota Society Of Pathologists



## REPORT OF THE COMMISSION ON MEDICAL SERVICE

The Commission on Medical Service met once on October 8, 1992. Eight physicians were in attendance.

The commission reviewed the report from the 1992 SDSMA House of Delegates Reference Committee on health access South Dakota. Seven problem areas had been identified and referred to the commission for study. Following discussion, six points were submitted to the Council from the Commission on Medical Service for consideration and approval. These points were:

1. For disabled patients, there is a period of time when they have no health care coverage. This is the waiting period between the ending of disability coverage and acceptance by the Medicare program.
2. Medical care is not always available to Title 19 patients. Some doctors find it necessary to limit the number of Title 19 patients they accept because the reimbursement to physicians under the Medicaid program may not cover the cost of providing care to the Medicaid patients.
3. Health insurance needs to be affordable for people. Some patients have been forced to drop their insurance because the deductible is so low, making the premium too high.
4. In rural areas some patients, particularly those under Title 19, have no transportation so they cannot get to the physicians they need. Not only does transportation to necessary medical care need to be provided but also we need to encourage provider distribution throughout the state.
5. Medicare requires that physicians collect the deductible and co-pay from Medicare recipients, except for those who are enrolled in the ShareCare program of the SDSMA. Physicians should receive information on this program on a regular basis so they can identify and educate their patients regarding the ShareCare Program.
6. There is a need for widespread insurance reform. We do not favor a state high risk insurance pool, but favor distribution of uninsurable persons to the current health insurance providers on an equitable basis.

The commission reviewed and accepted information provided by Dr. Richard Holm to the Council regarding the Drug Utilization Review Program for South Dakota.

The commission reviewed correspondence from the South Dakota Psychiatric Association regarding the state employees mental health benefits. Two problems seem to exist. The state restricts monetary coverage on inpatient psychiatric and substance abuse treatment services to \$7,500 per year and to \$22,500 life time. The monetary limits seem low compared to the restrictions of other insurance companies. Also, inpatient psychiatric services and substance abuse services are not the same and should be separated from each other and not grouped together. The

commission took no action, but will ask Dr. Bean to attend the next meeting to discuss further.

The commission reviewed a summary of problems submitted by physicians as it relates to correspondence and reimbursement from various insurance companies. No particular trend is found. The commission directed the

executive office to respond to the physicians submitting this information and to encourage them to respond to the insurance companies utilizing the letter developed by the Indiana Medical Association or a similar type response. The commission also directed the executive office to remind the clinic managers that SDSMA is maintaining a log of problems relating to reimbursement from insurers and they should feel free to submit information on such problems to the SDSMA office for continued tracking.

A proposal to offer HIV insurance to the SDSMA membership was reviewed. The commission recommended that SDSMA not offer this insurance to membership.

The commission then met with Julie Johnson and board members Irv Sterner, Jack Rentschler, and Tom Roby from the Office of Commerce and Industry to discuss the worker's compensation program for South Dakota. Several problems and viewpoints were discussed in a very frank and candid discussion. Problem areas identified were:

1. Who determines if an injury is work related? The physician should not be the one to make this determination.
2. Frequently doctors treat worker's compensation injuries without knowing they are job related. The physician needs to be notified in advance or at least at the beginning of the patient visit that this is a job related injury.
3. Sometimes the physician feels a worker can go back to work part time or do light duty work; however, the employer does not want the worker on a part time basis or on light duty or there are no or very limited light duty positions available.
4. The employer needs to talk with the physician to be certain the doctor understands the patient's job description and the patient's injury mechanism.
5. Once a person is injured and suffers pain, i.e. back pain, does worker's compensation have to be forever or can there be a cap on this or at least a re-evaluation of the injury?

Suggestions made were:

1. At the time a person is employed, the employer should get a signed release which will allow the doctor to share information on worker's compensation cases with the employer. If an injury occurs, then the employee would bring a copy of that release to the doctor.
2. The employer, either personally or in writing, should provide information to the physician about the patient's job description, injury incurred and the type and availability of part time and/or light duty work.
3. In worker's compensation cases, the physician should treat the employer as an equal with the patient and provide information to the employer on the patient's injury, treatment and prognosis.
4. The employer could provide a brief form for the physician to complete each time the physician sees

the worker's compensation patient which should give the employer a status report on the patient.

5. When a worker's compensation patient is seen for the first time there should be communication between the employer and physician outlining how



information on the patient will be communicated to the employer.

It was concluded that there is need for continued dialogue between physicians and representatives of industry. The commission directed the executive office to summarize the discussion, submit the summary to the Council for review and possible publication in the Grab Bag. Another suggestion was to develop a pamphlet or paper, regarding the needs of physicians and employers for information in worker's compensation cases that could be distributed throughout the state. This idea is for future consideration.

Respectfully submitted,

Robert W. Harms, MD, Chairman  
Commission on Medical Service

*The Reference Committee reviewed the report of the Commission on Medical Service and recommended acceptance of this report with two additional recommendations: 1) that a representative of the South Dakota Psychiatric Association be invited to attend the next meeting of the Commission to assist the Commission in the preparation of a letter of concern about the disparity between covered mental health benefits as opposed to other covered health benefits for state employees, and 2) that the commission investigate ways to ensure physician input regarding Workers' Compensation in South Dakota.*

#### REPORT OF THE COMMISSION ON SCIENTIFIC MEDICINE

The Commission on Scientific Medicine recommended that the South Dakota State Medical Association consider development of a locum tenens service for South Dakota. The Office of Rural Health also identified this as a need in South Dakota. The South Dakota Medical Association office surveyed solo and partner physicians throughout the state concerning the need for such a service, and they surveyed all physicians to see who would be willing to serve in a locum tenens capacity. This information will be compiled and made available to anyone seeking locum tenens coverage. The SDSMA determined that the association should not be involved in hiring locum tenens physicians or providing services, but should be utilized as a clearinghouse, for putting those in need of locum tenens physicians with those who will work as locum tenens. Dr. Mary Carpenter, representing the SDSMA, is pursuing this further with the Office of Rural Health and other interested parties.

The commission explored some of the needs of the statewide Emergency Medical Services System. Needs identified included updating equipment and ambulances, continuing education for EMS personnel, and medical direction for the ambulance services. The Department of Health is addressing these issues and has appointed an EMS advisory group which includes four physicians from the state, all of whom are members of the SDSMA. The Health Department indicated that they would keep the commission apprised of developments as the advisory group meets and addresses these issues.

Injuries and fatalities from motor vehicle accidents were reviewed. Previously, the SDSMA had endorsed legislation to require the use of seat belts. However, this failed to pass both the 1992 and 1993 legislatures. The commission recommended that doctors encourage the use of seat belts as part of their preventive medical care.

The commission developed the program for the scientific session for the June meeting of the SDSMA. The session will

consist of eight short scientific sessions and a longer session on physicians' use of computers. Also a panel on health care reform will be presented by guest speakers, Dr. H. Boyd Shook, ASIM Trustee; Barb Smith, the secretary for the South Dakota Department of Health; and Thomas Krafka, MD, SDSMA president elect.

Respectfully submitted,

Curt Buchholz, MD, Chairman  
Commission on Scientific Medicine

*The Reference Committee reviewed the report of the Commission on Scientific Medicine and recommended acceptance of the report as submitted.*

#### REPORT OF THE COMMISSION ON INTERNAL AFFAIRS, COMMUNICATIONS AND LIAISON

The Commission reviewed the August, 1992 financial report and accepted this report. The Commission also reviewed the report from the Doctor of the Day Program for the 1992 legislative session. Most comments were positive about the Doctor of the Day Program. A discussion was held concerning the arrangements for the 1993 session. The Association's three lobbyists, Dave Gerdes, Dean Krogman and Dennis Duncan, will again work with the Doctor of the Day. Each district medical society was assigned a number of days according to its membership to provide the Doctor of the Day. The executive summary of the AMAs 1992 Survey on Physician and Public Opinion on Health Care Issues was accepted for information. The Commission decided to not reprint "Putting the UCR Fee Puzzle Together". The Commission also reviewed a copy of brochures provided by Lawrence and Schiller. Some changes were made to the brochures and it was decided that Mr. Johnson would review the contract and also the services provided to determine how the Association would proceed with the relationship with Lawrence and Schiller.

Respectfully submitted,

Kenneth B. Peterson, MD, Chairman  
Commission on Internal Affairs, Communications and  
Liaison

*The Reference Committee reviewed the report of the Commission on Internal Affairs, Communications and Liaison and recommended acceptance of the report as submitted.*

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**1993-1994 BUDGET**  
**SOUTH DAKOTA STATE MEDICAL ASSOCIATION**  
**GENERAL FUND**

| INCOME                       |                     |                     |
|------------------------------|---------------------|---------------------|
| ITEM                         | BUDGETED<br>1992-93 | BUDGETED<br>1993-94 |
| State Dues                   | \$310,000.00        | \$320,000.00        |
| Annual Meeting               | 35,000.00           | 40,000.00           |
| Refunds & Misc.              | 13,000.00           | 15,000.00           |
| Car Reimbursement            | 2,000.00            | 2,000.00            |
| Continuing Medical Education | 2,000.00            | 2,000.00            |
| Salary Reimbursement         | 58,500.00           | 96,765.00           |
| Other Programs               |                     |                     |
| Equip. Replacement Fund      | 18,000.00           | 18,000.00           |
| Med. Student & Res. Dues     | 1,500.00            | 1,500.00            |
| Interest                     | 8,000.00            | 8,000.00            |
| Accounting Service Income    | 2,000.00            | 2,000.00            |
| Building Fund Transfer       | <u>19,000.00</u>    | <u>20,000.00</u>    |
|                              | \$469,000.00        | \$525,265.00        |

| EXPENSES                     |                     |                     |
|------------------------------|---------------------|---------------------|
| ITEM                         | BUDGETED<br>1992-93 | BUDGETED<br>1993-94 |
| Salaries                     | \$195,000.00        | \$210,630.00        |
| Social Security              | 15,000.00           | 15,166.00           |
| Legal & Audit                | 15,000.00           | 30,000.00           |
| Telephone & Lease Payments   | 6,000.00            | 6,000.00            |
| Office Supplies              | 12,000.00           | 10,000.00           |
| Dues & Subscriptions         | 1,000.00            | 1,000.00            |
| Physician's Travel           | 17,000.00           | 17,000.00           |
| Annual Meeting               | 30,000.00           | 25,000.00           |
| Public Relations             | 40,000.00           | 40,000.00           |
| Journal Subsidy              | 7,000.00            | 4,000.00            |
| Postage                      | 12,000.00           | 12,000.00           |
| Miscellaneous                | 100.00              | 100.00              |
| Legislation                  | 17,000.00           | 20,000.00           |
| Staff Travel                 | 15,000.00           | 15,000.00           |
| Insurance                    | 4,500.00            | 4,000.00            |
| Retirement/Fringe Benefits   | 58,000.00           | 65,000.00           |
| Car Operation & Maintenance  | 2,500.00            | 2,500.00            |
| Auxiliary Allocation         | 4,000.00            | 4,500.00            |
| Unemployment Tax             | 850.00              | 750.00              |
| Continuing Medical Education | 2,000.00            | 1,500.00            |
| Income Tax                   | 500.00              | 500.00              |
| Medical Student Support      | <u>2,000.00</u>     | <u>2,000.00</u>     |
|                              | \$456,450.00        | \$486,646.00        |
| Reserve                      | <u>12,550.00</u>    | <u>38,619.00</u>    |
|                              | \$469,000.00        | \$525,265.00        |

|                 |                 |               |
|-----------------|-----------------|---------------|
| Journal Subsidy | 7,000.00        | 4,000.00      |
| Miscellaneous   | <u>1,000.00</u> | <u>400.00</u> |
|                 | \$34,500.00     | \$33,200.00   |

| EXPENSES                   |                     |                     |
|----------------------------|---------------------|---------------------|
| ITEM                       | BUDGETED<br>1992-93 | BUDGETED<br>1993-94 |
| Salaries                   | \$ 2,200.00         | \$ 2,200.00         |
| Legal & Audit              | 100.00              | 0                   |
| Social Security            | 100.00              | 125.00              |
| Telephone                  | 100.00              | 150.00              |
| Postage                    | 4,000.00            | 5,500.00            |
| Office Supplies & Printing | 27,500.00           | 25,000.00           |
| Travel                     | 500.00              | 00                  |
|                            | \$34,500.00         | \$32,975.00         |
| Reserve                    |                     | <u>225.00</u>       |
|                            |                     | 33,200.00           |

| BUILDING FUND       |                     |                     |
|---------------------|---------------------|---------------------|
| INCOME              |                     |                     |
| ITEM                | BUDGETED<br>1992-93 | BUDGETED<br>1993-94 |
| Brzica Building     | \$37,000.00         | \$ 37,000.00        |
| DakotaCare Rent     | 120,000.00          | 114,000.00          |
| Foundation Rent     | 53,000.00           | 53,000.00           |
| Board of Exam. Rent | 12,000.00           | 12,860.00           |
| Miscellaneous       | 100.00              | 100.00              |
|                     | \$222,100.00        | \$216,960.00        |

| EXPENSES                 |                     |                     |
|--------------------------|---------------------|---------------------|
| ITEM                     | BUDGETED<br>1992-93 | BUDGETED<br>1993-94 |
| Property Taxes           | \$24,000.00         | \$24,000.00         |
| Salaries                 | 29,000.00           | 29,000.00           |
| Legal & Audit            | 4,000.00            | 4,000.00            |
| Social Security          | 2,500.00            | 3,300.00            |
| Legal & Audit            | 4,000.00            | 4,000.00            |
| Utilities                | 20,000.00           | 20,000.00           |
| Maintenance & Supplies   | 22,000.00           | 28,000.00           |
| Insurance                | 6,000.00            | 5,000.00            |
| Mortgage Payments        | 78,000.00           | 78,000.00           |
| Transfer to General Fund | <u>20,000.00</u>    | <u>20,000.00</u>    |
|                          | \$205,500.00        | \$211,300.00        |
| Reserve and accrual for  |                     |                     |
| Income Tax               | <u>16,600.00</u>    | <u>5,660.00</u>     |
|                          | \$222,100.00        | \$216,960.00        |

*The Reference Committee reviewed the proposed budget for fiscal year 1993-94 and recommended acceptance of the budget as submitted.*

**1993-1994 BUDGET**  
**JOURNAL OF MEDICINE**

| INCOME        |                     |                     |
|---------------|---------------------|---------------------|
| ITEM          | BUDGETED<br>1992-93 | BUDGETED<br>1993-94 |
| Advertising   | \$25,000.00         | \$27,500.00         |
| Subscriptions | 1,500.00            | 1,300.00            |

**REPORT OF THE COMMISSION ON  
PROFESSIONAL LIABILITY**

One of the responsibilities for the commission was to develop criteria for insurance companies seeking endorsement by the State Medical Association. The basic idea was to set up standards and requirements and all companies meeting these standards and requirements would be endorsed by the State Medical Association. Initially the



executive office was to inquire of the State Insurance Department their requirements for companies writing professional liability insurance in South Dakota. These were provided to the commission. It was recommended that the companies writing professional liability insurance be listed in the South Dakota Journal of Medicine and/or the Grab Bag along with their A M Best ratings. At the spring meeting the commission developed a questionnaire which could be completed by professional liability carriers in South Dakota. The information from the questionnaire would then be available to South Dakota physicians so individuals could determine the best coverage for him/herself. It was noted that some State Medical Associations do endorse specific professional liability companies and others do not. The South Dakota State Medical Association has never endorsed a particular company and the commission feels that it is better to gather and provide information for individual physicians to make their own decision rather than to endorse specific companies.

Sample risk management cases from St. Paul Fire and Marine were reviewed and considered for publication in the South Dakota Journal of Medicine. It was recommended that a tort review section be included in the Journal, and this has been started. In conjunction with professional liability actions, it was felt that a professional support group would be helpful to physicians and their spouses when facing the emotional impact of such legal action. Information was included in the Grab Bag requesting physicians and spouses experiencing or being threatened with legal action to contact the executive office. This is not intended to be a formal group but rather to provide support and empathy on a personal basis through telephone conversations or informal meetings.

The commission also reviewed the cost of medical professional liability in the 80's looking at the AMA's federation outreach report which contained information on the cost of professional liability insurance and its effect on the cost of medical care. The prelitigation certification concept was discussed. It was noted that South Dakota law allows arbitration; however, this mechanism has not been used to date. The St. Paul Companies published a booklet entitled "Ten Procedures for Avoiding Medical Malpractice" and it was recommended that this be made available to physicians through the Grab Bag. We also considered the new OSHA and CLIA requirements realizing that this has placed some liability on the smaller clinics and offices in the state and would probably cause some to close their labs. The commission recommended that at this point physicians and their patients be encouraged to contact their congressman to communicate the unnecessary expense and inconvenience experienced by the public with the closing of these labs to meet the OSHA and CLIA requirements.

Respectfully submitted,

Mitchel Rydberg, MD, Chairman  
Commission on Professional Liability

*The Reference Committee reviewed the report of the Commission on Professional Liability and recommended acceptance of the report as submitted.*

#### REPORT OF THE BUDGET AND AUDIT COMMITTEE

The Budget and Audit Committee met January 19, 1993, to review the proposed budget for 1993-94. The budget was reviewed. There were certain significant changes from the previous year. Some of the significant changes were legal

and audit expenses that were increased because of the South Dakota State Medical Association's participation in a suit against the state of Minnesota challenging their Health Right Law. There also was a change in the estimation of the DAKOTACARE rent because it had been over-estimated in the previous year's budget.

The budget was then accepted with the understanding that there may be a change by the April 16th Council meeting.

At the time of the April 16th Council meeting there had been a change because the Board of Medical Examiners to the State Medical Association increased their administrative reimbursement and this made a change of approximately \$80,000. The budget was accepted.

Respectfully submitted,

Kenneth B. Peterson, MD, Chairman  
Budget and Audit Committee

*The Reference Committee reviewed the report of the Budget and Audit Committee and recommended acceptance of the report as submitted.*

#### REPORT OF THE SHARECARE COMMITTEE

During 1992, there were no meetings held by the ShareCare Committee. The program continues to function well and during the past year new application/brochure forms were printed and distributed to physicians' offices, senior citizens groups, county health nurses as well as being distributed to all Medicare recipients in South Dakota. The number of ShareCare cards issued continues to rise each year with over 700 issued at the present time by the South Dakota State Medical Association office. South Dakota currently has over 650 physicians who participate in this program.

Also during this past year the program has been working with a public relations firm to update and publicize this program. public service announcements have been prepared as part of this campaign and distributed to TV and radio stations throughout South Dakota.

If anyone has any recommendations to make for the ShareCare program, please feel free to contact one of the committee members.

Respectfully submitted,

Tony L. Berg, MD, Chairman  
ShareCare Committee

*The Reference Committee reviewed the report of the ShareCare Committee and recommended acceptance of the report as submitted.*

#### REPORT OF THE GRIEVANCE COMMISSION

The Grievance Commission convened at the time of the annual meeting of the South Dakota State Medical Association with all members present. Matters of the previous year were reviewed and found to have been satisfactorily concluded. The complaints of the 1991-92 year were actually fewer in number, but the gravity of the complaints led to long, sincere soul-searching on the part of all the members of the commission in order to arrive at a resolution which we feel has been satisfactory to both parties in these complaints.

As usual, if complaints regarding fees are excluded, the matter is almost always an issue of physician/patient communications; and, regrettably, it is more often the physician

who is not doing his part in communicating with his patients. While the outcomes are generally as expected, the anxiety and apprehension experienced by the patient and/or the patient's family are the almost uniform features of the complaints handled by this commission. It behooves us to continue our efforts to be certain that we explain adequately and completely to our patients and their families what we are planning for their benefit.

We wish to thank Jan Anderson and her staff for their conscientious efforts and assistance provided the commission during the entire year. I, personally, would like to thank the other members of the commission for their thoughtful, conscientious and, in most cases, prompt responses in the matters brought before us.

Respectfully submitted,

Robert L. Ferrell, MD, Chairman  
Grievance Commission

*The Reference Committee reviewed the report of the Grievance Commission and recommended acceptance of the report as submitted.*

#### REPORT OF THE SOUTH DAKOTA POLITICAL ACTION COMMITTEE

SoDaPAC was extremely active this past election year. We supported 18 candidates in the primary from both parties and over two-thirds of our selected candidates won their respective primary elections. Total amount spent on primary elections was \$3,700 with an average of \$200 going to each candidate. During the general election, SoDaPAC supported 65 candidates of which over 70 percent won their race. A total of \$14,000 was spent on the general election with an average contribution of about \$215 per candidate.

Our experience with the state legislature this past session proved to be much more successful than in previous years and I feel that's more than partly due to our support and interest in these candidates during their primary and general election campaigns. SoDaPAC is alive and well but continues to need your support so that we can continue to make a positive impact on the legislative process here in the state of South Dakota.

I have enjoyed serving as your chairman on the SoDaPAC Board of Directors and I will continue to take an active interest in SoDaPAC and its activities in the coming years.

Respectfully submitted,

Michael Pekas, MD  
SoDaPAC Chairman

*The Reference Committee reviewed the report of the South Dakota Political Action Committee and recommended acceptance of the report as submitted.*

#### REPORT OF THE BOARD OF DIRECTORS OF THE SOUTH DAKOTA MEDICAL SCHOOL ENDOWMENT ASSOCIATION

The annual meeting of the Board of Directors of the South Dakota Medical School Endowment Association convened on Friday, June 5, 1992, at 7:00 am with the following present for roll call:

Drs. Joseph Hamm, T.H. Sattler, and Bruce Allen. Staff members present were Robert Johnson and Jan Anderson. The meeting adjourned at 8:15 am.

As president of the Board, I dictated the annual spring letter to all alumni as well as all doctors in the state of South

Dakota. This was sent out in April. Again, during the school year, the Endowment Association provided about \$70,000 to the University of South Dakota School of Medicine for loans to medical students. In the letter, statistics were given that indicated that we received from donations about \$10,195 from alumni outside the state of South Dakota as a result of the spring solicitation letter. Donations received from a Christmas solicitation amounted to about \$21,500. The cost of medical education continues to increase. This is outlined by Dr. Lynn, Dean of Student Affairs. He also provided the Board with grant and loan information for the academic years of 1991 and 1992. The Board of Regents have increased the tuition and fees by 4.6%. Health insurance costs for students have increased, and of course, so has the general cost of living. In addition to loaning endowment funds last year, an additional six loans which totaled \$23,720 were made from the Bequest Loan Fund, a fund managed by the Endowment Association. It should be noted that 20 students had their tuition waived. The total loan monies awarded in the 1991-1992 academic year showed an increase of 21.5% over the previous year. I hope that this will continue to increase as a result of the generosity of the alumni and friends of the School of Medicine.

I have again enjoyed the privilege of serving as president of the Board of the Endowment Association. Again, I would like to thank Jan Anderson on behalf of the Board for the tremendous job of running the program that she has done during the last year. I frankly do not know what we would do without her.

This will be the last report that I will render as president of the Association. After 50 years, I have retired from active practice. If the Board still wants me to serve on the Board as a member, I will be glad to do so, but not as president. I will continue to take great interest and pride in the South Dakota School of Medicine inasmuch as because of the school, there are now five MD's and one ex-MD in the Giebink family. I look forward to attending the state meeting in June.

Respectfully submitted,

Robert R. Giebink, MD, President  
South Dakota Medical School Endowment Association  
Board of Directors

*The Reference Committee reviewed the report of the Board of Directors of the South Dakota Medical School Endowment Association and recommended acceptance of the report as submitted.*

#### REPORT OF THE PHYSICIANS HELP COMMITTEE

The committee met at the annual meeting in June 1992 in Rapid City with eight members present.

The committee has received several requests for information and for assistance during the past year. Generally the outcome of these referrals has been satisfactory, and I do appreciate the efforts of the committee members in this regard. Work is underway to revise the committee's brochure and this will be followed by mailings to physicians, spouses and other allied organizations and professions in an effort to make them aware of this program and the assistance we can provide.

I look forward to meeting with this committee during our 1993 state meeting in Sioux Falls.

Respectfully submitted,  
Neil Elkjer, MD, Chairman



*Serving South Dakota  
Physicians and their clinics  
for the past 37 years...*



**South Dakota Blue Shield**

® Registered Service Mark of the Blue Cross and Blue Shield Association

### Physicians HELP Committee

*The Reference Committee reviewed the report of the Physicians HELP Committee and recommended acceptance of the report as submitted.*

### REPORT OF THE ARCHIVES AND HISTORY COMMISSION

There were two projects undertaken this year. The first was the identification and location of the Medical Association archives. The archives are found to be located at the Center for Western Studies at Augustana College and a catalog of those archives has been promised to me by Robert Johnson, the Chief Executive Officer.

The second project is one that should be of increasing value over the years, and that is, an oral history of doctors' experiences practicing medicine in South Dakota. We are initially interviewing physicians 65 years and older. This is judged worthwhile as we accumulate some of these tapes that they too will be made available to the Center for Western Studies.

Respectfully submitted,

John H. Hoskins, MD, Chairman  
Archives and History Commission

*The Reference Committee reviewed the report of the Archives and History Commission and recommended acceptance of the report as submitted.*

### REPORT OF THE AIDS TASK FORCE

In September, 1991, the Council of the South Dakota State Medical Association designated the AIDS Task Force to be the State Medical Association's representative to the South Dakota State Health Department on medical issues concerning AIDS.

The AIDS Task Force has continued in that role as well as serving as an advisory group within the South Dakota State Medical Association on medical issues concerning AIDS.

During this past year the AIDS Task Force has provided recommendations to the Council of the South Dakota State Medical Association concerning issues affecting physicians and their patients contained in the South Dakota State Health Department's policy on AIDS.

All members of the South Dakota State Medical Association benefit from the efforts of the AIDS Task Force. I want to thank all members of the Task Force for their work this past year.

Respectfully submitted,

Bruce C. Lushbough, MD, Chairman  
AIDS Task Force

*The Reference Committee reviewed the report of the AIDS Task Force and recommended acceptance of the report as submitted.*

### REPORT OF THE MEDICAL-LEGAL COMMITTEE

The Medical-Legal Committee met officially twice during this past committee year, the first meeting being held on November 11, 1992, and the second meeting on February 26, 1993. The committee is composed of seven physicians, all members of the South Dakota State Medical Association, and seven attorneys, all members of the State Bar of South Dakota. The committee is supported by the South Dakota State Medical Association through Mrs. Jan Anderson and Bob Johnson. The Medical Association office has also

agreed to funnel information to the committee members of both the State Medical Association and the State Bar Association to help coordinate the committee meeting efforts and secure the meeting places. The first meeting in November was held in Sioux Falls and was co-chaired by Mr. James Olson, attorney, and myself. An item of business was a discussion on depositions, their timeliness, and charges. It was felt that physicians need a full explanation from the attorney as to what is to be included in the deposition and the process for obtaining a deposition. Suggestions were made to conduct these depositions before or after office hours at the convenience of the physician. It was felt that it was out of place for this committee to determine charges for a deposition; however, it was felt that a subcommittee should be set up including both attorneys and physicians, to develop a letter to be sent to all physicians and attorneys in the state of South Dakota explaining the deposition process and how both professionals can best facilitate the deposition process.

A second item for discussion was an interprofessional program. Again, a subcommittee was set up including members of both professions to proceed with plans for a joint conference. It was suggested that it might be held in conjunction with some other event of importance in the state or in a resort area, and also giving the law and medical students an opportunity to attend. This committee felt that it would be useful to have an afternoon session followed by a joint social event, and then perhaps a following morning program. Topics of felt interest were estate planning, living wills, limited liability corporations, depositions, testifying in court, and HIV testing and confidentiality.

A third item of business was the concern for HIV confidentiality and the related need for physicians and other health care providers to know the patient's status. It was felt that the South Dakota State Medical Association should ask Dave Gerdes to draft legislation addressing this concern for consideration by the committee. The ramifications were also discussed regarding requested testing for HIV on a minor child by the parents without the child's knowledge or consent. It was felt that this might be a good topic for the interprofessional session.

There was interest expressed in drafting a bill for the 1993 legislative session to allow for limited liability corporations in South Dakota. This would probably be introduced by the Bar Association and could be endorsed by the Medical Association. Some time was spent in discussing the durable power of attorney and living will statutes and the physician's need to follow the directives of a living will or durable power of attorney when the doctor is not aware of these directives and the patient is unable to tell the doctor. The legal side of the committee expressed that immunity is granted to the physician through the durable power of attorney law, but not the living will law. The attorney members agreed to review this and make suggestions for necessary amendments to the law and submit this to the entire committee for consideration. Once again, the interprofessional code for physicians and attorneys of South Dakota was reviewed and it was recommended that this booklet should be reprinted and mailed to all physicians and attorneys.

At the meeting in February of 1993, the letter explaining the deposition process was reviewed, corrected, and processed for mailing to all physicians and attorneys in the state. It was recommended to the attorneys in the state when scheduling a deposition that a copy of this letter be sent to the physician involved on each occasion. The interprofes-



sional meeting subcommittee was delayed because of some illness and a final format has not yet been worked out. Bob Johnson reported at this meeting that it appears that the limited liability bill will pass the 1993 legislature.

One case came before the committee regarding what was considered overcharges for copies of medical records; however, this situation was resolved prior to the committee taking any action. It was, however, recommended that information regarding the South Dakota statute referring to copies of medical records should be included in one of the Grab Bag Newsletters of the State Medical Association to make all physicians aware that these records must be provided and that there is a limitation on charges regarding these records.

These represent the issues discussed and currently being worked on. It is my personal impression that this combined committee of the two professions fulfills a very significant void in our interprofessional relationship. Please do not hesitate to inform this committee of any interprofessional conflicts you are having as this committee does stand ready to resolve these problems between the two professions. Also, if you have any special topics of interest that you would like discussed in a joint interprofessional environment, please let the State Medical Association office know.

Respectfully submitted,

**Jerry L. Walton, MD**

### Co-Chairperson

## Medical-Legal Committee

*The Reference Committee reviewed the report of the Medical-Legal Committee and recommended acceptance of the report with the recommendation that the committee consider establishing a fee schedule for providing copies of medical records and if the committee is unable to establish such a fee that they be made aware this is a problem and some physicians have been threatened by attorneys regarding their charges for this service.*

## ANNUAL MEETING MINUTES SOUTH DAKOTA FOUNDATION FOR MEDICAL CARE

**June 10, 1993**  
**Thursday, 9:55 am**

**Ramkota Inn**  
**Sioux Falls, SD**

**The 18th Annual Meeting of the South Dakota Foundation for Medical Care was held on Thursday, June 10, 1993, at 9:55 am at the Ramkota Inn, Sioux Falls, South Dakota.**

The meeting was called to order by President Charles Hart, MD. The roll call was taken with the following members being present: Drs. Stephan Schroeder; M. George Thompson; Thomas Krafka; James Reynolds; Mary Carpenter; James Engelbrecht; Robert Ferrell; Michael Pekas; Richard Porter; James Hovland; Stephen Gehring; Richard Holm; Thomas Huber; Curtis Buchholz; Lucio Margallo; Jeffrey Hagen; Rodney Parry; Lowell Hyland; Robert Raskowski; Larry Meyer; Richard Renka; John Barlow; Gregg Tobin; James Collins; Joseph Kass; Winston Odland; James Larson; Curtis Wait; Phillip Hoffsten; Howard Saylor; K. Gene Koob; Guy Tam; Daniel Kennelly, M.D.; Carol Zielike; Stephen Haas; John Vidoloff; Jerome Eckrich; William Taylor; Roger Carter, M.D.; Steven Feeney; Aaron Shives; Tad Jacobs; Brent Lindbloom; Ken Bartholomew; Jeffrey Hanson; Angelina Trujillo; Amanda Story; Patti Giebink; Tom Reynolds; Walter Carlson; James Ryan; Robert Talley; Donald Knudson; David Bean; Russell Harris; Laura Larsen; David Smith; Duane Reaney; Thomas

**Hermann; Charles Hart; O. Myron Jerde; Allen Nord; James Rud; Nathaniel Whitney; Joseph Hamm; and John Malm.**

The President declared a quorum present for the purpose of conducting business of the corporation.

The President called for consideration of the minutes of the last annual meeting. He referred the membership to the Foundation minutes in the printed manual furnished to each member. It was moved and seconded that the minutes be accepted as published and the reading thereof waived. Upon voice vote the same was approved unanimously.

Dr Hart reported that the following persons were nominated for vacant terms of three years on the Board of Directors. There being no other nominations the following persons were declared elected to serve on the Board of Directors: Drs Jerome Howe; E. W. Sanderson; Kenneth Bartholomew; Daniel Heinemann; John Vidoloff; and Mr Jon Soderholm.

Dr Hart called for consideration of the corporate financial report. He noted that the financial report was published in the Handbook which was furnished to each member of the body. Dr Hart asked the membership if there were any questions, qualifications, or corrections. There being no comments, the financial report was accepted as published.

Dr Hart referred the membership to the written report made by the President, and published in the Handbook, and also the written report contained therein of the Foundation's Medical Director. He asked if anyone had any questions on the operations of the Foundation. There being none, he noted that the reports would be filed with the records of the Foundation accordingly.

Dr Hart then asked for the consideration of other business. There being none, the meeting was adjourned at 10 am.

**ANNUAL MEETING MINUTES SOUTH DAKOTA  
STATE MEDICAL HOLDING COMPANY, INC.**

**June 10, 1993**  
**Thursday, 10:00 a.m.**

**Ramkota Inn**  
**Sioux Falls, SD**

The 5th Annual Meeting of the South Dakota State Medical Holding Company, Inc., was held on Thursday, June 10, 1993, at 10:00 am at the Ramkota Inn, Sioux Falls, South Dakota.

The meeting was called to order by President Robert Ferrell, MD. The roll call was taken with the following members being present: Drs. Stephan Schroeder; M. George Thompson; Thomas Krafka; James Reynolds; Mary Carpenter; James Engelbrecht; Robert Ferrell; Michael Pekas; Richard Porter; James Hovland; Stephen Gehring; Richard Holm; Thomas Huber; Curtis Buchholz; Lucio Margallo; Jeffrey Hagen; Rodney Parry; Lowell Hyland; Robert Raskowski; Larry Meyer; Richard Renka; John Barlow; Charles Hart; Gregg Tobin; James Collins; Joseph Kass; Winston Odland; James Larson; Curtis Wait; Phillip Hoffsten; Howard Saylor; K. Gene Koob; Guy Tam; Daniel Kennelly; Carol Zielike; Stephen Haas; John Vidoloff; Paul Eckrich; Jerome Eckrich; William Taylor; Roger Carter; Steven Feeney; Aaron Shives; Tad Jacobs; Gerald Turner; Brent Lindbloom; Ken Bartholomew; Jeffrey Hanson; Angelina Trujillo; Amanda Story; Janet Smith; Patti Giebins; Tom Reynolds; Walter Carlson; James Ryan; Kara Murphy; Robert Talley; R. Maclean Smith; Donald Knudson; David Bean; Russell Harris; Laura Larsen; David Smith; Jem Hof;

Duane Reaney; Thomas Hermann; Lew Papendick; Charles Hart; O. Myron Jerde; Allen Nord; James Rud; Jeanne Bennett; Nathaniel Whitney; H. Lee Ahrlin; Joseph Hamm; Harland Hermann; John Malm; a delegate of the South Dakota State Medical Association representing the Class B shareholders of the corporation; and the proxy of 12,177 Class C stockholders. The President declared a majority of the shares entitled to vote, either in person or by proxy, present and therefore there is a quorum present for the purpose of doing business of the corporation.

The President called for consideration of the minutes of the last annual meeting. He referred the membership to the SDSMHC minutes in the printed manual furnished to each member. The minutes were accepted as published and the reading thereof waived.

Dr. Ferrell reviewed the financial report as published in the Handbook with the membership present. Dr. Ferrell also stated that because DAKOTACARE has grown to \$5 million in assets, \$2 million in net worth, and currently has over 500 stockholders, the corporation would be required to file certain reports with the Securities and Exchange Commission and that these reports are in the process of being prepared. For the benefit of the newer members of the corporate body, Dr. Ferrell provided a brief history on how DAKOTACARE was established and the corporation matured to the present state of its operations. Dr. Ferrell also stated that DAKOTACARE has engaged the Sherlock Company of Pennsylvania to value the company and the stock in order to provide the members with an idea as to the value of the stock if it is transferred.

Dr. Ferrell reviewed the two amendments to the Articles of Incorporation proposed by the Board of Directors. The first amendment would clarify the ownership restrictions of Class C stock and the second amendment would reduce the par value of the Class C stock. Notice of the amendments and proxies was previously mailed to all Class A, B, and Class C stockholders and also was available at this corporate body meeting for use by each member of each class of shareholders. The President advised the membership results of the election will be announced as the votes are tabulated.

Dr. Ferrell reported on the election results for the vacant positions on the Board of Directors. The following persons were nominated for the election to the Board of Directors by the Nominating Committee: Guy Tam, M.D.; Mr. Pat Beckman; and Mr. Bernard Christenson. Frank Alvine, M.D., was nominated by the membership. A count of the votes for the physician position on the Board held by Guy Tam, MD. The vote was Guy Tam, M.D., 209; Frank Alvine, M.D., 121. Guy Tam, MD, was declared the winner. No further nominations were received for the consumer directors other than Pat Beckman and Bernard Christenson, and therefore they were declared the winners of the two consumer Board seats. Dr. Ferrell asked for any comments or further business from the floor. All comments and questions raised by the corporate body members were addressed. There being no further business, the meeting was adjourned at 10:45 a.m.

## MINUTES OF SOUTH DAKOTA MEDICAL SERVICE, INC. CORPORATE BODY MEETING

10:45 am  
Thursday, June 10, 1993

Bay 2 & 3, Exhibit Hall  
Ramkota Inn, Sioux Falls, SD

Chairman McDermott called the meeting of the Corporate Body of the South Dakota Medical Service, Inc, to order at 10:45 am, June 10, 1993, at the Ramkota Inn, Sioux Falls, South Dakota.

On roll call vote, the following members of the Corporate Body of the South Dakota Medical Service, Inc, were present: Doctors M. George Thompson, Thomas Krafka, James Reynolds, Mary Carpenter, Stephan Schroeder, James Engelbrecht, Robert Ferrell, Michael Pekas, Richard Porter, James Hovland, Stephen Gehring, Richard Holm, Thomas Huber, Curtis Buchholz, Lucio Margallo, Jeffrey Hagen, Rodney Parry, Lowell Hyland, Robert Raszkowski, Larry Meyer, Richard Renka, John Barlow, Gregg Tobin, James Collins, Joseph Kass, Winston Odland, James Larson, Curtis Wait, Phillip Hoffsten, Howard Saylor, K. Gene Koob, Guy Tam, Daniel Kennelly, Carol Zielke, Stephen Haas, John Vidoloff, Jerome Eckrich, William Taylor, Roger Carter, Steven Feeney, Aaron Shives, Tad Jacobs, Gerald Turner, Brent Lindbloom, Ken Bartholomew, Jeffrey Hanson, Angelina Trujillo, Amanda Story, Janet Smith, Patti Giebink, Tom Reynolds, Walter Carlson, James Ryan, Karla Murphy, Robert Talley, R. Maclean Smith, Donald Knudson, David Bean, Russell Harris, Laura Larsen, David Smith, Jem Hof, Duane Reaney, Thomas Hermann, Lew Papendick, Charles Hart, O. Myron Jerde, Allen Nord, James Rud, Jeanne Bennett, Nathaniel Whitney, H. Lee Ahrlin, Joseph Hamm, Harland Hermann, John Malm, and students Bill Rizk and Ronald Divine.

A quorum being present, the Chairman declared the annual meeting of the membership of the Corporate Body of the South Dakota Medical Service, Inc., to be duly in session for the transaction of business.

Dr Taylor moved that the reading of the minutes of the last meeting of the Corporate Body, being the 1992 annual meeting, be waived, the same having been published and mailed to each member previously. Such motion was seconded by Dr Saylor. Upon voice vote, the same was approved unanimously.

Chairman McDermott presented the Chairman's message to the Corporate Body and noted the complete message was printed in their handbook. No action being necessary on the Chairman's report, none was taken.

Chairman McDermott called upon President Ben Johnson to review the 1992 Annual Report. Mr Johnson noted that each of the members were sent a copy of Blue Shield's annual statement for 1992 prior to this meeting. He highlighted certain items contained therein. He specifically mentioned that the Blue Shield 1992 premium income of \$59,662,599 and claims paid of \$52,401,672 shows that 87.8% of premium income was paid back to our subscribers. Blue Shield's underwriting gain in 1992 was \$2,873,027 or 4.8% of premium income, and its investment income was \$1,388,918. After deducting \$875,800 federal income taxes, the net gain to surplus was \$3,386,145 or 5.7% of income. In 1991, Blue Shield processed 909,353 claims. In 1992, Blue Shield processed 909,376 claims. With no questions being addressed from the floor, Mr Johnson concluded his report.



Chairman McDermott, at this point of the meeting, stated the next order of business was the election of directors. He asked Dr Larson to present the report of the Nominating Committee. Dr Larson reported as follows: The Nominating Committee appointed by the Blue Shield Board of Directors recommended current Directors James B. Dunn of Lead and William O. Rossing, MD of Sioux Falls be re-elected to the Board of Directors. The Nominating Committee also recommended and nominated Michael J. Brown, MD of Spearfish and John Waltner of Freeman for election to the Blue Shield Board of Directors. The Chairman called for nominations from the floor. Dr Hamm moved that the nominations be closed and a unanimous ballot be cast for the nominees. Dr Collins seconded the motion. Upon voice vote, the same was approved unanimously, and the secretary was instructed to show a unanimous ballot thereon.

The Chairman asked if there was any old business which any delegate desired the Corporate Body to consider. No old business was presented by any delegate.

The Chairman called for consideration of any new business that any delegate would like to bring before the Corporate Body. Dr Thompson inquired concerning the recent news article which announced the proposed merger of Blue Cross and Blue Shield of Illinois, Blue Cross and Blue Shield of Iowa, and Blue Cross of South Dakota. He wondered what effect this would have on South Dakota Blue Shield and what Blue Shield would foresee in the future.

Chairman McDermott asked Mr Ben Johnson to respond to Dr Thompson's question. Mr Johnson stated that South Dakota Blue Shield was not involved in this proposed merger, and no further information concerning this matter had been made available to Blue Shield. He noted that South Dakota Blue Shield was a separate corporation with a working relationship with Blue Cross of South Dakota which is governed by an operating contract. Mr Johnson noted that staff would be monitoring activities concerning the proposed merger and will report to the Blue Shield Board of Directors on any activity or direction which should be noted by South Dakota Blue Shield.

Chairman McDermott called for any further business to come before the Corporate Body. There being none, he called for a motion to adjourn the Corporate Body meeting. Dr Carter moved that the meeting be adjourned. Dr Ryan seconded the motion. Upon voice vote, the same was approved unanimously.

Philip M. Davis  
Secretary

**YOUR CONTRIBUTION  
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SOUTH DAKOTA  
MEDICAL SCHOOL  
ENDOWMENT FUND**

#### DISTINGUISHED SERVICE AWARD

Started in 1951. . . T. F. Riggs, MD, Pierre (deceased)  
1952 . . . H. Russell Brown, MD, Watertown (deceased)  
1953 . . . Guy VanDemark, MD, Sioux Falls (deceased)  
1954 . . . J. C. Ohlmacher, MD, Vermillion (deceased)  
1955 . . . R. G. Mayer, MD, Aberdeen (deceased)  
1956 . . . J. C. Ohlmacher, MD, Vermillion (deceased)  
1957 . . . W. E. Donahoe, MD, Sioux Falls (deceased)  
1958 . . . Drs. J. C. Hagin (deceased), M. W. Pangburn  
          . . . . . (deceased), and James DeGeest, Miller  
1958 . . . J. F. Brenckle, MD, Superior, WI (deceased)  
1958 . . . Mrs. Agnes Holdridge, Madison  
1959 . . . Walter L. Hard, PhD, Vermillion  
1959 . . . Rev. and Mrs. Robert O. Bates, Sturgis  
1959 . . . R. M. Kilgard, MD, Watertown (deceased)  
1960 . . . L. J. Pankow, MD, Sioux Falls (deceased)  
1961 . . . Gregg M. Evans, PhD, Custer  
1962 . . . Edward Shaw, PhD, Vermillion (deceased)  
1963 . . . Arthur A. Lampert, MD, Rapid City  
1964 . . . John C. Foster, Phoenix, AZ  
1965 . . . A. P. Reding, MD, Marion  
1966 . . . Mrs. C. Rodney Stoltz, Sioux Falls  
1967 . . . Mrs. William Fish, Watertown  
1968 . . . G. J. Bloemendaal, MD, Ipswich (deceased)  
1969 . . . F. W. Haas, MD, Yankton (deceased)  
1970 . . . Paul Bunker, MD, Aberdeen (deceased)  
1971 . . . E. T. Lietzke, MD Beresford (deceased)  
1972 . . . C. B. McVay, MD, Yankton (deceased)  
1973 . . . G. E. Tracy, MD, Watertown  
1974 . . . J. A. Muggly, MD, Madison (deceased)  
1975 . . . Harvey Wollman, Hitchcock  
1976 . . . R. H. Quinn, MD, Spearfish  
1977 . . . E. H. Heinrichs, MD, Vermillion (deceased)  
1978 . . . John Olson, Sioux Falls,  
          . . . . . and Evans Nord, Sioux Falls (deceased)  
1979 . . . Helen Jane Hare, MD, Rapid City  
1980 . . . Warren Jones, MD, Sioux Falls  
1981 . . . Saul Friefeld, MD, Brookings  
1982 . . . G. Robert Bartron, MD, Watertown  
1983 . . . Oscar J. Mabee, MD, Mitchell  
1984 . . . Karl Wegner, MD, Sioux Falls  
1985 . . . William R. Taylor, MD, Aberdeen  
1986 . . . R. E. VanDemark, Sr, MD, Sioux Falls  
1987 . . . Bruce C. Lushbough, MD, Brookings  
1988 . . . John J. Stransky, MD, Watertown  
1989 . . . John Barlow, MD, Rapid City  
1990 . . . Durward Lang, MD, Sioux Falls (deceased)  
1991 . . . Russell H. Harris, MD, Sioux Falls  
1992 . . . Joseph N. Hamm, MD, Sturgis  
1993 . . . Robert L. Ferrell, MD, Rapid City

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1962 . . . Roland F. Hubner, MD, Yankton (deceased)  
1963 . . . George W. Mills, MD, Wall (deceased)  
1964 . . . John C. Hagin, MD, Miller (deceased)  
1965 . . . Alonzo P. Peeke, MD, Volga (deceased)  
1966 . . . Hugo C. Andre, MD, Vermillion (deceased)  
1967 . . . G. Robert Bartron, MD, Watertown  
1968 . . . M. M. Morrissey, MD, Pierre (deceased)  
1969 . . . N. J. Sundet, MD, Kadoka (deceased)  
1970 . . . W. H. Saxton, MD, Huron (deceased)

1971 . . . R. E. VanDemark, Sr, MD, Sioux Falls  
 1972 . . . R. H. Hayes, MD, Wall (deceased)  
 1973 . . . B. F. King, MD, Aberdeen (deceased)  
 1974 . . . M. C. Tank, MD, Brookings (deceased)  
 1975 . . . Karl Wegner, MD, Sioux Falls  
 1976 . . . John T. Elston, MD, Rapid City  
 1977 . . . W. F. Stanage, MD, Yankton  
 1978 . . . C. S. Roberts, Jr, MD, Brookings  
 1979 . . . C. J. McDonald, MD, Sioux Falls (deceased)  
 1980 . . . E. A. Johnson, MD, Milbank  
 1981 . . . J. A. Muggly, MD, Madison (deceased)  
 1982 . . . Robert R. Giebink, MD, Sioux Falls  
 1983 . . . Theodore H. Sattler, MD, Yankton  
 1984 . . . Paul Hohm, MD, Huron  
 1985 . . . George Mangulis, MD, Philip  
 1986 . . . Richard Friess, MD, Sioux Falls  
 1987 . . . Melford B. Lyso, MD, Sioux Falls  
 1988 . . . Brooks Ranney, MD, Yankton  
 1989 . . . William R. Taylor, MD, Aberdeen  
 1990 . . . Reuben Bareis, MD, Rapid City  
 1991 . . . O. Myron Jerde, MD, Rapid City  
 1992 . . . Duane Reaney, MD, Yankton  
 1993 . . . Nathaniel Whitney, MD, Rapid City

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 Henry Borgmeyer, MD, Rapid City  
 W. C. Brinkman, MD, Sisseton (deceased)  
 R. A. Buchanan, MD, Huron (deceased)  
 John L. Calene, MD, CA (deceased)  
 Myrtle Carney, MD, TX (deceased)  
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 J. C. Clark, MD, Sioux Falls (deceased)  
 F. L. Class, MD, Huron (deceased)  
 M. E. Cogswell, MD, Wolsey (deceased)  
 E. H. Collins, MD, Gettysburg  
 J. Cook, MD, Bonesteel (deceased)  
 G. I. W. Cottam, MD, Sioux Falls (deceased)  
 Harold L. Crane, MD, CT (deceased)  
 William A. Delaney, Jr, MD, Mitchell  
 S. A. Donahoe, MD, Sioux Falls (deceased)  
 W. E. Donahoe, MD, Sioux Falls (deceased)  
 J. A. Eckrich, Sr, MD, Aberdeen (deceased)  
 V. W. Embree, MD, Pierre (deceased)  
 W. D. Farrell, MD, Aberdeen (deceased)  
 R. B. Fleeger, MD, Lead (deceased)  
 R. R. Fisk, MD, Flandreau (deceased)  
 R. W. Freyberg, MD, Mitchell (deceased)  
 E. E. Gage, MD, Sioux Falls (deceased)  
 D. A. Gregory, MD, MT (deceased)  
 E. H. Grove, MD, Arlington (deceased)  
 M. Stuart Grove, MD, Sioux Falls  
 J. C. Hagin, MD, Miller (deceased)  
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 Lyle Hare, MD, Spearfish (deceased)  
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 Emil Hofer, MD, Huron  
 J. A. Hohf, MD, Yankton (deceased)  
 Theodore A. Hohm, MD, Huron

F. S. Howe, MD, Deadwood (deceased)  
 A. H. Hovne, MD, Salem (deceased)  
 Roland Hubner, MD, Yankton (deceased)  
 A. S. Jackson, MD, Rapid City (deceased)  
 R. J. Jackson, MD, Hot Springs (deceased)  
 J. A. Jacotel, MD, Milbank (deceased)  
 G. T. Jordan, MD, Vermillion (deceased)  
 F. F. Keene, MD, Wessington Springs (deceased)  
 H. O. Kittelson, MD, Sioux Falls  
 Arthur A. Lampert, Sr, MD, Rapid City  
 Ray Lemley, MD, Rapid City (deceased)  
 Bernard Lenz, MD, Huron (deceased)  
 J. H. Lloyd, MD, Mitchell (deceased)  
 O. J. Mabee, MD, Mitchell  
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 P. V. McCarthy, MD, Aberdeen (deceased)  
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 R. J. Quinn, MD, Sioux Falls (deceased)  
 F. J. Radusch, MD, CA (deceased)  
 T. B. Ranney, MD, Aberdeen (deceased)  
 Arthur P. Reding, MD, Marion  
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 I. R. Salladay, MD, Ft. Meade (deceased)  
 W. H. Saxton, MD, Huron (deceased)  
 H. L. Saylor, MD, Huron (deceased)  
 C. S. Schad, DO, Rapid City  
 C. E. Sherwood, MD, Brookings (deceased)  
 Arthur W. Spiry, MD, Mobridge (deceased)  
 Myron Tank, MD, Brookings (deceased)  
 F. J. Tobin, MD, Mitchell (deceased)  
 Leonard W. Tobin, MD, Mitchell (deceased)  
 J. S. Tschetter, MD, Huron (deceased)  
 Paul Tschetter, MD, Huron  
 F. W. Valkenaar, MD, Chancellor (deceased)  
 G. E. VanDemark, MD, Sioux Falls (deceased)  
 Cleo L. Vogelee, MD, Aberdeen  
 H. P. Volin, MD, Lennox (deceased)  
 C. H. Weishaar, MD, Aberdeen (deceased)  
 J. R. Westaby, MD, Madison (deceased)  
 G. E. Zimmerman, MD, MT (deceased)

#### C. B. ALFORD AWARD

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 1975 . . . Gerald Tracy, MD, Watertown  
 1976 . . . Robert Westaby, MD, Hot Springs  
 1977 . . . Robert VanDemark, Sr, MD, Sioux Falls  
 1978 . . . Howard Saylor, Jr, MD, Huron  
 1979 . . . J. D. Bailey, MD, Rapid City  
 1980 . . . John T. Elston, MD, Rapid City  
 1981 . . . T. H. Sattler, MD, Yankton  
 1982 . . . Bedford T. Otey, MD, Flandreau  
 1983 . . . Robert H. Quinn, MD, Spearfish



1984 . . . Granville Steele, MD, Aberdeen  
 1985 . . . Robert Hayes, MD, Wall (deceased)  
 1986 . . . Leonard Linde, MD, Mobridge  
 1987 . . . Richard Sample, MD, Madison  
 1988 . . . Willis Stanage, MD, Yankton  
 1989 . . . Reuben Bareis, MD, Rapid City  
 1990 . . . Rodney Parry, MD, Sioux Falls  
 1991 . . . Donald Humphreys, MD, Sioux Falls  
 1992 . . . Thomas Welty, MD, Rapid City

#### SPECIAL PRESIDENTIAL AWARD

1979 . . . G. Robert Bartron, MD, Watertown  
 1983 . . . Gerald E. Tracy, MD, Watertown  
 1986 . . . Russell H. Harris, MD, Rapid City  
 1991 . . . Robert E. VanDemark, Sr, MD, Sioux Falls  
 1991 . . . Dennis L. Johnson, MD, Sioux Falls (deceased)  
 1991 . . . Parry S. Nelson, MD, Watertown (deceased)

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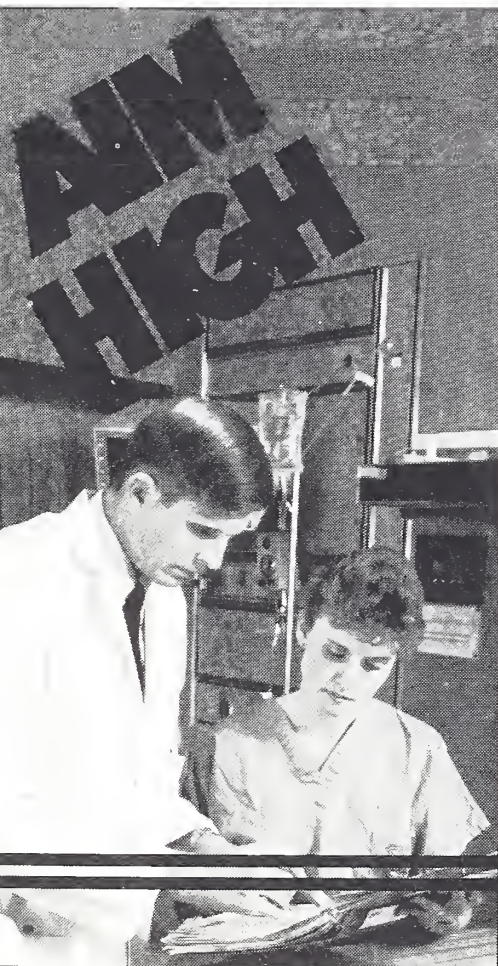
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**Patti Herlihy, President, South Dakota State Medical Association Auxiliary**

Another SDSMA Alliance Convention and AMAA House of Delegates meeting have come and gone. Just a short while ago (it seems!) I was eagerly anticipating these two events. Now they are history, and I have gained a great deal from experiences in Sioux Falls and Chicago.

If we could all attend the annual SDSMA Alliance convention (yes, we did change the name), we would never have to worry about membership or goals again. If each one of us could hear the district reports prepared by the district presidents we would not wonder what excellent projects the Alliance members accomplish in South Dakota. If all of us could know the people in the South Dakota State Medical Association and Alliance who give so much of themselves to further the health of all South Dakotans, we would never dream of missing the SDSMAA convention again. But I know this is not possible, so somehow I must try to make you appreciate what an excellent state organization we truly have in South Dakota.

Changing our name from Auxiliary to Alliance is a perfect chance to reaffirm the unique partnership we have with our spouses, working together to better health care for all. We have a new focus, too—health care reform. The tag line after our name "physicians' spouses dedicated to the health of America" sums it up perfectly. According to Hillary Clinton, reform is about a new sense of community and caring. Doesn't she realize that this is nothing new to the medical community? Patient care is the bottom line of

medicine's special interest—it always was, is, and will be. Our membership is being reactivated and revitalized. Health care reform is going to happen regardless of our personal desires—we might as well take an active role in shaping its outcome in our state and country. Strength through membership will make all of this a reality.

I had the privilege of attending the AMA Alliance House of Delegates meeting in Chicago following our state convention in Sioux Falls. It was the ideal opportunity to contrast the workings of the Alliance at these two levels. Even though the organization is smaller at the state level, we still generate the same type of individual commitment. In fact, the dedication of the volunteers and staff here at home may be even greater in one sense, because we must continually draw on many of the same individuals to fill the leadership rolls. New faces are enthusiastically welcomed and definitely needed!

As I read the South Dakota state report in Chicago prepared by our past-president, Ruth Parry, I could not help but swell with pride. Each state gives a similar report so a comparison could easily be made between different states. I can honestly report that South Dakota was right up there at the top! Thank you, Ruth, for your outstanding leadership!

The twelve districts of South Dakota have elected new officers for the 1993-94 year. I am excited and encouraged by the new-and old-names presented for president:

|             |   |
|-------------|---|
| District 1  | Mary Vidoloff (John)<br>Lorraine Steele (Granville) |
| District 2  | Janet Lamb (Marlin R.)                              |
| District 3  | Linda Heilman (Bernard)                             |
| District 4  | Peggy Stout (Steve)                                 |
| District 5  | Krista Landreth (Knute, Jr.)                        |
| District 6  | Darlene Buhler (Carey)                              |
| District 7  | Ann Nelson (Robert)                                 |
| District 8  | Ann M. Wiggs (James)                                |
| District 9  | Patti Sanmartin (Jorge)                             |
| District 10 | Kay Berg (Tony)                                     |
| District 11 | Lolis Linde (Leonard)                               |
| District 12 | Mary Bjordahl (Kevin)                               |

With this leadership we have a most promising year ahead. I thank each of you for all you do for ALL of us and especially acknowledge the sacrifices your volunteer service necessitates for both you and your families. And, finally, I thank all of you for giving me the opportunity to attend these conventions and serve as your president. As Barbara Tippins, President-Elect of the AMA Alliance, stated in Chicago: "It's O.K. to be excited and I'm very excited!"

*Patti Herlihy*



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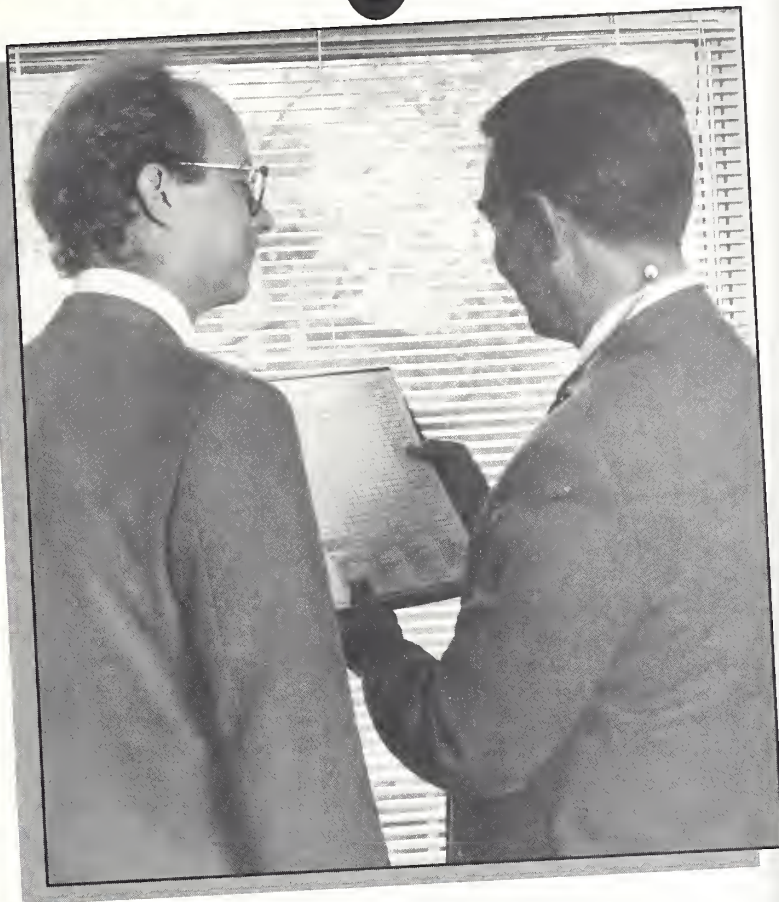
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|--|---|

## Patient Counseling: There is a Need

*Debra Farver, Pharm.D, Yankton, SD*

As changes in health care occur, it seems appropriate that an increased emphasis in patient education concerning medications is needed. The following case report portrays the importance of this concept.

### CASE REPORT

SH is a 67 year old white female who presented to the clinic with severe bruising. Four days prior to admission, the patient stated that she took six aspirin 80 mg. The following day, she developed a hematoma on her tongue along with bruising of her right flank area, ring finger of the right hand, and lower extremities. She sought advice from her dentist, who referred her to her medical doctor. Significant laboratory values were prothrombin time (PT) of 62 seconds, activated partial thromboplastin time (PTT) of 108 seconds, and values within the normal range for the D-DI test, fibrin degradation product, fibrinogen and complete blood count. Urinalysis revealed numerous red blood cells and stools tested positive for occult blood. The patient's medications included aspirin 80 mg/day, Lopressor, Maxzide and Pravachol. Upon admission to the hospital, the size of the tongue hematoma made her unable to close her mouth, speak clearly or swallow. She received 2 units of fresh frozen plasma and the follow-up PT and PTT was 18.7 and 48.8 secs, respectively.

The patient was questioned about the possibility of inadvertently taking warfarin which was prescribed for her husband. She denied using the warfarin. Due to the lack of apparent etiology of the coagulopathy, a plasma warfarin level was ordered. The patient's husband was requested to bring in all medications from home. Evaluation of the medications revealed tablets of 5 mg warfarin in the bottle labeled "baby aspirin". The patient stated that she transferred mail order medication into bottles that did not have safety caps. Prior to admission, she had taken 6 warfarin (30 mg) tablets instead of six baby aspirin. She also stated that she had probably been unintentionally taking the warfarin daily for about 6 months. She commented that both warfarin and the baby aspirin were peach colored tablets and that she didn't discern the difference. Upon discharge, the PT was 12.8 sec., PTT was 27.6 sec. and the hematoma and bruising were resolving. The warfarin level, drawn 5 days after she had taken the tablets, returned after discharge with a value of 2.9 mcg/ml (a normal therapeutic concentration is 2.0-5.0 mcg/ml).

## DISCUSSION

The Omnibus Budget Reconciliation Act of 1990 (OBRA 90) mandates that pharmacists counsel Medicaid patients about their medications. Each state board of pharmacy reviewed procedures concerning this issue. It was felt that currently, pharmacists are educating patients about their medications, but a uniform guideline to insure the health, safety, and welfare of the patient would be appropriate. The South Dakota State Board of Pharmacy adopted rules effective January 1, 1993. The board adopted these rules for all patients receiving prescriptions that are new, refills, mailed or delivered. The pharmacist is to provide information verbally, covering the following elements as applicable:

1. The name and description of the drug;
2. The dosage form, dose, route of administration, and duration of drug therapy;
3. The intended use of the drug and its expected action;
4. Special directions and precautions for preparation, administration, and use by the patient;
5. Common severe side or adverse effects or interactions and therapeutic contraindications that may be encountered, including, their avoidance, and the action required if they occur;
6. Techniques for self-monitoring drug therapy;
7. Storage requirements;
8. Prescription refill information;
9. Action to be taken if a dose is missed; and
10. The pharmacist's comments relevant to the individual's drug therapy, including any other information peculiar to the specific patient or drug.

Written materials are an alternative when personal oral counseling is not practical or when the information cannot be completed by a telephone conversation with the pharmacist. When written information is given, the patient is advised to contact the pharmacist with questions via the telephone. Long distance calls for counseling are not to be charged to the patient.

Although OBRA 90 has specific guidelines for pharmacists in medication counseling, physicians and nurses are also part of this circle. In the case report, it was the combined efforts of the physicians, pharmacist, nursing staff and family who were able to solve the question of this patient's coagulopathy. Many patients can list their medications but, in this case the key was actually looking in each prescription bottle.

Some physicians advise their patients to bring all of their medication bottles in to the clinic or hospital. The patient may be obtaining prescriptions from other physicians or pharmacies and a complete list cannot be

found in any single record or file. A patient record system was also a part of the adopted rules. It will provide immediate retrieval of information and will be maintained for at least one year from the date of the last entry in the record. This system may not solve the problem of patients using numerous pharmacies, but it will provide information on previous use of medications.

How did the system fail this patient in monitoring for drug related problems? She and her husband were receiving their medication from a mail order pharmacy outside the state of South Dakota. The rules discussed above are for pharmacies within this state. Other states may or may not have required medication education for all patients.

Communication between patients and their health care providers has been and will always be an important aspect of insuring the well being of the patient. The goal of avoiding severe medication complications will be achieved by the combined efforts of physicians, pharmacists and other health care professionals.



Edited by Brian Kaatz, Pharm.D.



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Jones, Warren L. .... Sioux Falls  
Justice, Michael W. .... Dell Rapids  
Kalda, Ellison F. II .... Sioux Falls  
Kangley, Daniel J. .... Sioux Falls  
Kannan, Hari D. .... Sioux Falls  
Karl, Stephen R. .... Sioux Falls  
Kaufman, Irvin I. .... Freeman  
Kavanaugh, Kevin .... Sioux Falls  
Kemp, Earl D. .... Sioux Falls  
Kennelly, Daniel J. .... Sioux Falls  
Keppen, Laura .... Sioux Falls  
Keppen, Michael. .... Sioux Falls  
Kihne, Michael .... Sioux Falls  
\*King, Lyndon M., Jr .... Sioux Falls  
Kirton, Kenneth .... Freeman  
\*Kittelston, H. Otis .... Sioux Falls  
\*Knowles, Roy C. .... Sioux Falls  
Knudson, Donald H. .... Sioux Falls  
Knutson, Dennis D. .... Sioux Falls  
Kontos, George J., Jr .... Sioux Falls  
Koob, K. Gene .... Sioux Falls  
Kovacs, Stephen J. .... Sioux Falls  
Kuck, Paul .... ND  
Kummer, Mark .... Sioux Falls  
Kunkel, Shirley .... Sioux Falls  
Kunkel, Steve .... Sioux Falls  
Kutayli, Farid .... Sioux Falls  
Lakstigala, Peters E. .... Sioux Falls  
Lang, Terry A. .... Sioux Falls  
Lankhorst, Barry J. .... Sioux Falls  
Laput, Aleksandra M. .... Sioux Falls  
Larsen, David .... Sioux Falls  
Larsen, Laura J. R. .... Sioux Falls  
Larson, Leland J. .... Sioux Falls  
Lawler, Patricia J. .... Sioux Falls  
\*Lee, Si Gaph .... AZ  
Lockwood, William .... Sioux Falls  
Looby, Thomas L. .... Sioux Falls  
Lovrien, Fred .... Sioux Falls

Mabee, Lee M. .... Sioux Falls  
MacRandall, Daniel G. .... Sioux Falls  
Madison, Dean L. .... Sioux Falls  
Magidson, Melvin A. .... Sioux Falls  
Magnuson, Gregory L. .... Sioux Falls  
Mahnke, Mark W. .... Sioux Falls  
Mallek, John A. .... Sioux Falls  
Mark, Curtis L. .... Viborg  
Marten, Brian R. .... Sioux Falls  
Masterson, Thomas E. .... Sioux Falls  
McClafflin, Richard .... Sioux Falls  
McGrann, James R. .... Sioux Falls  
McGreevy, Patrick S. .... Sioux Falls  
McKercher, Scott W. .... Sioux Falls  
McMillin, J. Michael .... Sioux Falls  
Meyer, Robert D. .... Sioux Falls  
Meyer, Vaughn H. .... Sioux Falls  
Mikkelsen, Beth .... Sioux Falls  
Moench, Jerry L. .... Sioux Falls  
Mohama, Riyad .... Sioux Falls  
Mohler, Charles W. .... Sioux Falls  
Morgan, Timothy .... Sioux Falls  
Morris, Alan D. .... Sioux Falls  
Munson, David P. .... Sioux Falls  
Murphy, Karla .... Sioux Falls  
Murray, Jeffrey A. .... Sioux Falls  
Mutch, Milton G., Jr .... Sioux Falls  
Nagelhout, David .... Sioux Falls  
Naughton, Gregory .... Sioux Falls  
Neidich, Gary A. .... Sioux Falls  
Nelmark, Robert A. .... Sioux Falls  
Nelson, Patrick A. .... Sioux Falls  
Nelson, Richard A. .... Sioux Falls  
Nelson, Robert E. .... Sioux Falls  
Nice, Richard F. .... Sioux Falls  
Nielsen, James L. .... Dell Rapids  
Nord, Wesley J. .... Sioux Falls  
Nordstrom, Donald G. .... Sioux Falls  
Nussbaum, David .... Sioux Falls  
Oakland, James A. .... Sioux Falls  
O'Brien, Charles P. .... Sioux Falls  
O'Brien, Peter J. .... Sioux Falls  
Ochsner, John A. .... Sioux Falls  
Oesterheld, Jessica .... Sioux Falls  
Ofstein, Lewis C. .... Sioux Falls  
Ohrt, David W. .... Sioux Falls  
Olson, Jennifer J. .... Sioux Falls  
Olson, Michael L. .... Sioux Falls  
Olson, Paul J. .... Sioux Falls  
Olson, Steven P. .... Sioux Falls  
\*Opheim, Warren L. .... Sioux Falls  
Opheim, Warren O. V. .... Sioux Falls  
Oppenheimer, Mark .... Sioux Falls  
Orr, Russell T. .... Sioux Falls  
O'Shea, Timothy .... Sioux Falls  
Owens, Leycester, Jr .... Sioux Falls  
Parry, Rodney R. .... Sioux Falls  
\*Pasek, Edward A. .... Sioux Falls  
Paul, K-Lynn .... Sioux Falls  
Payne, Harlan A. .... Sioux Falls  
Pederson, Kim A. .... Sioux Falls  
Pekas, Michael W. .... Sioux Falls

\*Petereit, Martin F. .... Sioux Falls  
Peters, Edward H. .... Sioux Falls  
Peters, Patricia A. .... Sioux Falls  
Peterson, Karl G. .... Sioux Falls  
Peterson-Henry, Terri .... Sioux Falls  
Pitt-Hart, Barry T. .... Sioux Falls  
Plummer, Richard L. .... Sioux Falls  
Pueringer, Robert .... Sioux Falls  
Putnam, Wesley D. .... Sioux Falls  
Quinlan, E. Denise .... Sioux Falls  
\*Quinn, Robert .... Spearfish  
Rabenberg, Rita .... Sioux Falls  
Randall, Bradley B. .... Sioux Falls  
Raskowski, Robert R. .... Sioux Falls  
Rath, G. Daniel .... Canton  
Reaney, John A. .... Sioux Falls  
Regier, Eugene R. .... Canton  
Reinertsen, Karen J. .... Sioux Falls  
Reynen, Paul D. .... Sioux Falls  
Reynolds, James R. .... Sioux Falls  
Reynolds Tom R. .... Sioux Falls  
Rezkalla, Maher .... Sioux Falls  
Richards, George A. .... Sioux Falls  
Richardson, James L. .... Sioux Falls  
Ridder, Glenn A. .... Sioux Falls  
Ridgway, Tim M. .... Sioux Falls  
Ries, Dennis D. .... Freeman  
Robbins, John .... Sioux Falls  
Robinson, Michael .... Sioux Falls  
Rodig, Mark .... Sioux Falls  
Rodman, Peter K. .... Sioux Falls  
Rolfsmeyer, Eric S. .... Sioux Falls  
Rossing, David R. .... Sioux Falls  
Rossing, William O. .... Sioux Falls  
Rost, Michael C. .... Sioux Falls  
Ryan, James E. .... Sioux Falls  
Ryan, John J. .... Sioux Falls  
Rydberg, Mitchel L. .... Dell Rapids  
Salem, Anthony G. .... Sioux Falls  
Sall, John C. .... Sioux Falls  
Salmela, Steven R. .... Sioux Falls  
Sanchez, Gonzalo M. .... Sioux Falls  
Sanchez, Jorge D. .... Sioux Falls  
Sanderson, Everett W. .... Sioux Falls  
Schafer, Larry W. .... Sioux Falls  
Schellpfeffer, Donald .... Sioux Falls  
Schroeder, Greg .... Sioux Falls  
Schroeder, Michael R. .... Sioux Falls  
Schultz, Gregory A. .... Sioux Falls  
Schultz, Richard D. .... Sioux Falls  
Schultz, Thomas A. .... Sioux Falls  
Seger, Yvonne .... Sioux Falls  
Seidel, Robert R. .... Sioux Falls  
Shafer, Charles .... Sioux Falls  
Shields, David .... Sioux Falls  
Shreves, Howard B. .... Sioux Falls  
Simmons, Jerry L. .... Sioux Falls  
Sittner, Larry .... Sioux Falls  
Slattery, Mary T. .... Sioux Falls  
Smith, A. Donald .... Sioux Falls  
Smith, Janet E. .... Sioux Falls  
Smith, R. Maclean .... Sioux Falls



Snortum, Robert.....Sioux Falls  
 Solberg, Lloyd E. ....Sioux Falls  
 Sorenson, Arne C.....Sioux Falls  
 Soundy, Timothy J.....Sioux Falls  
 Soye, Andrew I. ....Sioux Falls  
 Spencer, Suzannah H.....Sioux Falls  
 \*Stahmann, Fred S. ....Sioux Falls  
 Stassen, Michael D. ....Sioux Falls  
 Steidl, Lester J. ....Sioux Falls  
 \*Steiner, Peter K. ....CA  
 Stensland, Vernon H. ....Sioux Falls  
 Stensrud, Homer .....Sioux Falls  
 Stevens, Dennis C. ....Sioux Falls  
 Stokka, Cameron .....Sioux Falls  
 Stoltz, C. Roger .....Sioux Falls  
 Story, Amanda J. ....Sioux Falls  
 Strawbridge, Lawrence ....Sioux Falls  
 Suga, Robert.....Sioux Falls  
 \*Sweeney, Lloyd J.....Sioux Falls  
 Talley, Robert C. ....Sioux Falls  
 Tam, Guy E. ....Sioux Falls  
 Teixeira, Jose.....Rapid City  
 Thomas, David .....Sioux Falls  
 Thomas, Melvin .....Sioux Falls

Thompson, Howard D. ....Sioux Falls  
 Thompson, Vance .....Sioux Falls  
 Tieszen, Jerel E. ....Sioux Falls  
 Tobin, Michael D.....Sioux Falls  
 Travers, Henry .....Sioux Falls  
 Trujillo, Angelina .....Sioux Falls  
 Tschetter, Loren K. ....Sioux Falls  
 Tschetter, Richard T. ....Sioux Falls  
 Uken, Patsy A. ....Sioux Falls  
 Uthe, Craig J.....Sioux Falls  
 Vaca, Anthony M. ....Sioux Falls  
 VanDemark, Robert, Jr....Sioux Falls  
 VanDemark, Robert, Sr....Sioux Falls  
 VanderWoude, John.....Sioux Falls  
 VanderWoude, Larry B. ...Sioux Falls  
 VanSloun, Wm .....MN  
 Vaska, Kevin J. ....Sioux Falls  
 Vogt, H. Bruce.....Sioux Falls  
 Volin, Verlynne V. ....Sioux Falls  
 Vonk, Galen .....Sioux Falls  
 \*Wagner, Loyd R. ....Sioux Falls  
 Wallace, James W.....Sioux Falls  
 Waltner, Lonnie L. ....Bridgewater  
 Walton, Jerry L. ....Sioux Falls

Watson, Mary.....Canton  
 Watson, William J. ....Sioux Falls  
 Watson, William V. ....Sioux Falls  
 \*Wegner, Karl H. ....Sioux Falls  
 Wellman, Lawrence R. ....Sioux Falls  
 Welter, Randal.....Sioux Falls  
 West, David .....Sioux Falls  
 Wheeler, Kirke H. ....Sioux Falls  
 White, Thomas C. ....Sioux Falls  
 Whittle, Kevin D. ....Sioux Falls  
 Wiebe, R. Herbert .....Sioux Falls  
 Wierda, Daryl R. ....Sioux Falls  
 Williams, Buck J. ....Sioux Falls  
 Willman, Brent .....Sioux Falls  
 Wilson, Thomas M. ....Sioux Falls  
 Wingert, Donald .....Sioux Falls  
 Wingert, Marvin E. ....Garretson  
 Wirtz, Patricia S. ....Sioux Falls  
 Witzke, David J. ....Sioux Falls  
 Wyatt, George W.....Sioux Falls  
 Wyatt, Ronald O. ....Sioux Falls  
 Zawada, Edward T. ....Sioux Falls  
 Zoellner, Timothy .....Sioux Falls

#### YANKTON DISTRICT No. 8

Pres, James Wiggs, MD

Aanning, Harald L. ....Yankton  
 Adams, Curtis M.....Yankton  
 Bubak, Gary A. ....Wagner  
 Carlson, Craig L.....Yankton  
 Dendinger, William J. ....Vermillion  
 Farver, Max.....Yankton  
 Ferrell, Robert T. ....Yankton  
 \*Fletcher, Harold J. ....Vermillion  
 Flom, Jon O. ....Yankton  
 Foley, Robert J. ....Tyndall  
 Frank, John J. ....Yankton  
 Gerhart, Victoria.....Dakota Dunes  
 Gilmore, Howard T. ....Yankton  
 Gunderson, Dale E. ....Yankton  
 Halverson, Kenneth .....Yankton  
 Hansen, Lori.....Yankton  
 Hazard, Lorraine.....IA  
 Held, Gordon .....GA  
 Hof, Jem .....Yankton  
 Holzwarth, David R. ....Yankton  
 Hubner, Jay W. ....Yankton  
 Isburg, Carroll D. ....Yankton  
 Jameson, G. Malcolm .....Yankton  
 Jenny, David .....Yankton  
 Johnson, Daniel .....Yankton  
 Johnson, Virginia P.....Vermillion

Vice Pres, Jem Hof, MD

\*Kalda, Ellison F. ....Platte  
 Kaplan, Richard.....Yankton  
 Kerr, James .....Yankton  
 King, Patrick H. ....Yankton  
 Krohn, David C.....Yankton  
 Liudahl, Jeffrey .....Yankton  
 Loperena, Rudolf .....Wagner  
 \*Lyso, Melford B. ....Sioux Falls  
 Mabee, Mark J.....Yankton  
 Mannes, Bruce .....Yankton  
 McVay, Michael R. ....Yankton  
 Megard, Daniel J. ....Yankton  
 Messner, Frank D. ....Yankton  
 Meyer, Larry A. ....Yankton  
 Milroy, Mary J. ....Yankton  
 Nelsen, Marcia .....Yankton  
 Neubauer, Jo Marie.....Yankton  
 Neumayr, Robert J. ....Yankton  
 Nicholson, Peter J.....Wagner  
 Olson, Thomas H. ....Vermillion  
 Pesce, Ulises .....Yankton  
 Porter, Richard I. ....Yankton  
 Potas, David G. ....Yankton  
 Radack, Morris L. ....Yankton  
 Ranney, Brooks .....Yankton  
 Reaney, Duane B. ....Yankton

Sec, Daniel Megard, MD

Reding, Arthur P. ....Marion  
 Rhoades, Marques E. ....Yankton  
 \*Riesberg, Elsa .....TX  
 Ruggles, James .....Yankton  
 Saloum, Herbert A. ....Tyndall  
 Samlowski, Ralph C.....Sioux Falls  
 Saoi, Nicasio B. ....Yankton  
 \*Sattler, Theodore H. ....Yankton  
 \*Sebring, Floyd U. ....CA  
 Smith, David A. ....Yankton  
 Sprik, Calvin .....Yankton  
 Stanage, Willis F. ....Yankton  
 Stephenson, Daryl R. ....Yankton  
 Sternquist, John C. ....Yankton  
 Stevens, Julie C. ....Vermillion  
 Thompson, Robert F.....Yankton  
 Tidd, John T. ....Yankton  
 Tuan, Chung H. ....Yankton  
 Turner, Charles R. ....Vermillion  
 Weber, Scott A. ....Wagner  
 Wells, John M. ....Yankton  
 Wiggs, James W. ....Yankton  
 Willcockson, John R. ....Yankton  
 \*Willcockson, Thomas H. ....Yankton  
 Yelverton, Charles .....Vermillion

#### BLACK HILLS DISTRICT No. 9

Pres, H. Thomas Hermann, Jr, MD

Ahrlin, Lee .....Rapid City  
 \*Ahrlin, Hollis L. ....Rapid City

Vice Pres, Cynthia Weaver, MD

Akerson, Robert D. ....Rapid City  
 Allen, Bruce H. ....Rapid City

Sec/Treas, N. R. Whitney, MD

Allen, Robert G., Jr .....Rapid City  
 Altstiel, Terry L. ....Fort Meade

Andersen, Victoria..... Hot Springs  
 \*Anderson, A. Byford .....Rapid City  
 Anderson, Dale R. ....Rapid City  
 Anderson, Wayne J. ....Spearfish  
 \*Bailey, John D. ....Rapid City  
 Bailey, Stephen P. ....Rapid City  
 Bareis, Reuben J. ....Rapid City  
 Barlow, John F. ....Rapid City  
 Barrett, Kathryn A.....Rapid City  
 Bauman, Randell E.....Rapid City  
 Bedingfield, John R., Jr.....Rapid City  
 \*Behrens, Clayton L. ....Rapid City  
 Belsaas, Rebecca.....Rapid City  
 Bennett, Jeanne M. ....Rapid City  
 Bergeron, Dale A. ....Rapid City  
 Berkebile, Dale E. ....Rapid City  
 Birch, Fredric .....Rapid City  
 \*Bloemendaal, Robert D. ..Rapid City  
 Bochna, Gary S. ....Rapid City  
 Boddicker, Marc E. ....Rapid City  
 \*Borgmeyer, Henry J. ....Rapid City  
 Bormes, Paul A. ....Rapid City  
 \*Boyce, Raymond A. ....Rapid City  
 Boyer, David W. ....Rapid City  
 Brady, Forrest S. ....Spearfish  
 \*Branch Robert F. ....Rapid City  
 \*Bray, Robert B. ....Rapid City  
 Brown, Michael J. ....Spearfish  
 Buehner, Marvin E.....Rapid City  
 Burnap, Donald W. ....Rapid City  
 Burnett, Raymond G. ....Rapid City  
 Butz, Gerald W. ....Rapid City  
 Calhoon, Stephen L. ....Rapid City  
 \*Cameron, Douglas E. ....Rapid City  
 Carlson, Gary L. ....Rapid City  
 Carver, Richard F.....Rapid City  
 Christensen, Michael.....Rapid City  
 \*Clark, Bernard S. ....Spearfish  
 Clement, Kathi .....Spearfish  
 Cornford, Raymond C. ....Rapid City  
 Cruse, Joseph R. ....Rapid City  
 Delaney, Thomas P.....Sturgis  
 Dewald, Allan L. ....Rapid City  
 Dick, Stephen .....Rapid City  
 Drabek, Gregg A.....Rapid City  
 Drummond, Ronald G. ....Rapid City  
 Dunlay, Robert W.....Rapid City  
 Durr, Samuel .....Rapid City  
 Durst, Robert, A., Jr.....Rapid City  
 Dzintars, Egon F. ....Rapid City  
 \*Dzintars, Paul F. ....Rapid City  
 Ebbert, Larry P. ....Rapid City  
 Eccarius, Scott .....Rapid City  
 \*Elston, John T. ....Rapid City  
 Engelbrecht, James A. ....Rapid City  
 Ferrell, Robert L. ....Rapid City  
 Feters, Barbara R. .... Hot Springs  
 Fields, Billy .....Spearfish  
 Finley, Richard C. ....Rapid City  
 Finley, Robert .....Rapid City  
 Finley, Victoria Kosters ....Rapid City  
 Franz, Daniel .....Rapid City

Freimark, Lyle G. ....Rapid City  
 Fromm, Harold E. ....Rapid City  
 Frost, Harold L. ....Rapid City  
 Frost, James A. ....Rapid City  
 Frost, Timothy.....Rapid City  
 Gibson, Robert.....Rapid City  
 \*Gilbert, Freeman J. ... Belle Fourche  
 Gill, Timothy J. ....Rapid City  
 Giuseffi, Steven A. ....Spearfish  
 Golliher, Warren N. ....Spearfish  
 Goodhope, Robert C. .... Fort Meade  
 Graff, Randall P. ....Deadwood  
 Groeger, Thomas .....Deadwood  
 Groote, Curtis A. ....Rapid City  
 Gwinn, Charles B. .... Fort Meade  
 Haas, Stephen N. ....Rapid City  
 Habbe, Donald .....Rapid City  
 Hafner, Daniel J. ....Rapid City  
 \*Hamm, Joseph N. ....Sturgis  
 Hansen, Craig K. ....Rapid City  
 Hanson, Charles.....Rapid City  
 Hanson, George .....Custer  
 \*Hare, Helen Jane .....Rapid City  
 Hart, Charles E. ....Rapid City  
 Hata, Steven K. ....Rapid City  
 Hayes, Craig R. ....Spearfish  
 Heintz, Douglas J. ....Rapid City  
 Herbst, John W. ....Rapid City  
 Hercules, Costas.....Rapid City  
 Herlihy, John J. ....Rapid City  
 \*Hermann, Harland, Sr ...Rapid City  
 Hermann H. Thomas, Jr .....Sturgis  
 Hewitt, Gregory..... Belle Fourche  
 Hicks, Terry .....Rapid City  
 Hofmann, Alfred R.....Rapid City  
 Honke, Sandra J. ....Rapid City  
 Howard, William J. ....Rapid City  
 Huot, Samuel W. ....Rapid City  
 Iverson, Gregory J. ....Rapid City  
 Jackson, James W. ....Rapid City  
 Jacobson, Theodore R. ... Hot Springs  
 \*James, Edward H.....Rapid City  
 Janss, Gerti J. ....Rapid City  
 Jenter, George W. ....Sturgis  
 Jentes, Paul K. ....Sturgis  
 Jerde, O. Myron .....Rapid City  
 Johnson, Dave R. ....Rapid City  
 Johnson, Paul S. ....Rapid City  
 Johnson, Robert K. ....Rapid City  
 \*Jones, William E. ....Sturgis  
 Keegan, James M. ....Rapid City  
 \*Kelley, Donald H. ....Deadwood  
 Kelts, K. Alan.....Rapid City  
 \*Klar, Werner .....Fort Meade  
 Knecht, John F. ....Martin  
 Knutson, Roger S. ....Rapid City  
 \*Koren, Paul H. ....Rapid City  
 Kovarik, Joseph A. ....Rapid City  
 \*Kovarik, Richard A. ....Rapid City  
 Kovarik, Stephen M. ....Rapid City  
 \*Kovarik, Wenzel, J. ....Rapid City  
 Krafka, Thomas L. ....Rapid City

Kunz, James A. ....Rapid City  
 Kwan, Francis P. ....Rapid City  
 \*Lampert, Arthur A., Sr ...Rapid City  
 Lauer, David A. ....Sturgis  
 Lewis, Charles A. ....Sturgis  
 Liedtke, Curtis J. ....Sturgis  
 Loos, Charles M. ....Rapid City  
 Lopez, Alberto S..... Hot Springs  
 Lord, Charles J. ....Rapid City  
 Lustig, Karl A. ....Spearfish  
 Mangulis, George J. .... Philip  
 Manlove, Stephen .....Rapid City  
 Massopust, Steven.....Rapid City  
 Mathews, Michael J. ....Rapid City  
 \*Mattson, William J. ....Rapid City  
 McCafferty, James D. ....Rapid City  
 \*McGuigan, Patrick.....Rapid City  
 McLaughlin, Ruth M.....Deadwood  
 \*Merryman, Murlin P. ....Rapid City  
 Millea, Roger P. ....Rapid City  
 Minton, Timothy P. ....Rapid City  
 Mortimer, Sam L. ....Rapid City  
 \*Munson, H. Benjamin ....Rapid City  
 Nesbit Dennis .....Rapid City  
 Neu, Norman D. ....Rapid City  
 Nixon, Robert B. ....Rapid City  
 Nord, Allen E. ....Rapid City  
 O'Brien, Kristin .....Rapid City  
 Oliver, Donald E. ....Rapid City  
 \*Owen, Gordon S. ....Rapid City  
 Panaskovic, Stephen A.....Rapid City  
 Papendick, Lew .....Rapid City  
 Parker, Jeffrey C. ....Spearfish  
 \*Perry, William J. ....Rapid City  
 Picardi, Edward .....Rapid City  
 Polizzi, Raymond A. .... Hot Springs  
 Preston, Robert.....Rapid City  
 Purdy, Drew A. ....Rapid City  
 Renka, Richard P. ....Rapid City  
 Rey, Daniel A.....Rapid City  
 Roberts, Bob H. ....Spearfish  
 Rosario, Elmo J. ....Rapid City  
 Ross, Scott K. ....Rapid City  
 Rud, James A. ....Rapid City  
 \*Ruud, Edward T. ....Rapid City  
 Sabow, John D. ....Rapid City  
 Sandvik, David E. ....Rapid City  
 Sanmartin, Jorge E. ....Rapid City  
 Schad, C. S. ....Rapid City  
 Schechter, Marc.....Rapid City  
 Schuft, James .....Sturgis  
 Schurrer, Michael .....Rapid City  
 Sejvar, Joseph P. ....Rapid City  
 Seljeskog, Edward L.....Rapid City  
 Shannon, Thomas H..... Fort Meade  
 Simmons, Lynn M. ....Rapid City  
 Simmons, Mathew E. ....Rapid City  
 Shining, H. Streeter .....Rapid City  
 Slama, David D. ....Rapid City  
 Slingsby, J. Geoffrey .....Rapid City  
 \*Slingsby, John B. ....Rapid City  
 Smith, Barry A.....Spearfish



Spahn, Martin S. ....Rapid City  
 Statz, Michael .....Rapid City  
 Stenberg, Jon R.....Rapid City  
 \*Stewart, Richard E. ....Sturgis  
 Stocks, Steven C. ....Rapid City  
 Strand, Ray D. ....Rapid City  
 Strong, Lori .....Sioux Falls  
 Sullivan, Daniel J. ....Rapid City  
 Sutliff, Willis C. ....Rapid City  
 Swisher, Lowell P. ....Kadoka  
 Tackett, Daniel M. ....Rapid City  
 Teuber, Larry L.....Rapid City  
 \*Theissen, Hubert H. ....Rapid City  
 Traub, Douglas .....Rapid City

Trinidad, Reuben B. ....CO  
 Tschetter, William R. ....Rapid City  
 Tschida, Brian.....Rapid City  
 VanEtten, Donald D. ....Rapid City  
 Vaughn-Whitley, Kelly E...Rapid City  
 Voegel, Kenneth A. ....Rapid City  
 Vosler, Steven T. ....Spearfish  
 Waltman, Steven E. ....Rapid City  
 Weaver, Cynthia .....Rapid City  
 Wehrkamp, Larry .....Sturgis  
 Weitzenkamp, Larry A. ....Martin  
 Welsh, Gary L. ....Rapid City  
 Welty, Edith R. ....Rapid City  
 Welty, Thomas K. ....Rapid City

Wessel, Alvin E. ....Rapid City  
 \*Westahy, Robert S. ....Rapid City  
 \*Whitney, Nathaniel R. ....Rapid City  
 Wicks, Dennis R. ....Custer  
 \*Williams, Francis R. ....AZ  
 Wingert, Robert I. ....Rapid City  
 Wojewski, Paul.....Rapid City  
 Wright, Paul L. ....Rapid City  
 \*Yackley, James V. ....Rapid City  
 Yamada, Andrew R. ....Rapid City  
 Zacker, Jeffrey J. ....Rapid City  
 \*Zanka, Jaroslav A. ....Rapid City  
 Zielike, Carol M. ....Rapid City

# ROSEBUD DISTRICT No. 10

Pres, Robert Stiehl, MD

Vice Pres, Edwin P. Sweet, MD

Sec/Treas, Gregg Tobin, MD

Berg, Tony L. ....Winner  
 Bolliger, Eugene F. ....Gregory  
 Boyd, Rock .....Burke  
 Carpenter, Mary S. ....Winner  
 Clark, Andrew .....Gregory

Kafka, Richard.....Gregory  
 Kosina, Thomas .....Winner  
 Malm, John A. ....Gregory  
 Mitchel, Pat W. ....Burke  
 Nemer, Raymond G. ....Gregory

Schramm, Melanie.....Winner  
 Stiehl, Robert L. ....Winner  
 Sweet, Edwin P. ....Burke  
 Tobin, Gregg .....Winner  
 Two Hawk, Sophie .....Rosehud

# NORTHWEST DISTRICT No. 11

Pres, Ben Henderson, DO

Vice Pres, J. D. Collins, MD

Sec, L. M. Linde, MD

Collins, James D. ....Mobridge  
 Head, Stephen.....Mobridge  
 Henderson, Ben J. ....Mobridge  
 Knowles-Smith, Peter .....ND

Linde, Leonard M. ....Mobridge  
 McFadden, Raymond J. ....DeSmet  
 \*Nolan, Bernard P. ....MN  
 Ottenbacher, John .....Selby

Ouranos, Hossein.....Gettysburg  
 Ramirez, Dionisio R.....Hoven  
 Wunder, James F. ....Deadwood  
 \*Yecha, David J. ....Gettysburg

# WHETSTONE VALLEY DISTRICT No. 12

Pres, Joseph Kass, MD

Vice Pres, Kevin Bjordahl, MD

Sec, Kevin Bjordahl, MD

Bell, Eldon E. ....FPO-NY  
 Bjordahl, Kevin L. ....Webster  
 Bloom, Alan .....Webster

\*Janavs, Visvaldis.....FL  
 \*Johnson, Edward A. ....Milbank  
 Kass, Joseph .....Rosholt

Nelson, Lawrence F.....Webster  
 Vanadurongvan, Kanya .....Milbank  
 Vanadurongvan, Vichit .....Milbank

## South Dakota State Medical Association Roster -- 1993 Membership -- Alphabetical Listing

Aamlid, Brian.....Sioux Falls  
 Aanning, Harald L. ....Yankton  
 Abu-Ghazaleh, Samir Z. ..Sioux Falls  
 Adajar, A.....Clear Lake  
 Adams, Curtis M.....Yankton  
 \*Adams, Harold P. ....Huron  
 Ahrlin, Lee.....Rapid City  
 \*Ahrlin, Hollis L. ....Rapid City  
 Akerson, Robert D. ....Rapid City  
 Alandy, Antonio M. ....Eureka  
 Aldrich, Marc N.....Sioux Falls  
 Allen, Bruce H. ....Rapid City  
 Allen, Raymond H. ....Sioux Falls

Allen, Robert G., Jr .....Rapid City  
 \*Allen, Stanley W., Jr .....Watertown  
 Altman, Stanley B. ....Aberdeen  
 Altstiel, Terry L. ....Fort Meade  
 Alvine, Frank G. ....Sioux Falls  
 Amundson, E. Paul.....Sioux Falls  
 Amundson, Loren H. ....Sioux Falls  
 Andersen, Victoria.....Hot Springs  
 \*Anderson, A. Byford .....Rapid City  
 Anderson, Courtney .....Sioux Falls  
 Anderson, Dale R. ....Rapid City  
 Anderson, Edward F. ....Sioux Falls  
 Anderson, Esther E. ....Aberdeen

Anderson, James A. ....Huron  
 Anderson, Keith A.....Sioux Falls  
 Anderson, Ronald.....Mitchell  
 Anderson, Wayne J. ....Spearfish  
 Andreone, Peter A. ....Sioux Falls  
 \*Angelos, Theodore A. ....NE  
 \*Argabrite, John W.....Watertown  
 \*Arneson, Wallace A.....Sioux Falls  
 Asfora, Wilson.....Sioux Falls  
 Ashhaugh, James H. ....Sioux Falls  
 \*Askwig, Leroy C. ....AZ  
 Aspaas, Paul K., Jr.....Sioux Falls  
 \*Aspaas, Paul K., Sr .....Dell Rapids

Assam, Susan ..... Sioux Falls  
 Atchison, Scott ..... Sioux Falls  
 Augspurger, Ken D. .... Sioux Falls  
 Awadallah, Sami ..... Sioux Falls

Baas, Walter P. .... Mitchell  
 Bachmayer, Jay D. .... Aberdeen  
 Backes, Richard J. .... Sioux Falls  
 Bahnson, Berne B. .... Sioux Falls  
 \*Bailey, John D. .... Rapid City  
 Bailey, Stephen P. .... Rapid City  
 Bandettini, Francis C. .... Sioux Falls  
 Bareis, Reuben J. .... Rapid City  
 Barker, John D., Jr. .... Sioux Falls  
 Barker, Phillip ..... Parkston  
 Barlow, John F. .... Rapid City  
 \*Barnett, George L. .... Sioux Falls  
 Barrett, Kathryn A. .... Rapid City  
 Barth, Richard ..... Sioux Falls  
 Bartholomew, Ken ..... Pierre  
 Bartron, G. Robert ..... Watertown  
 Bauer, Barry C. .... Sioux Falls  
 Baugh, William R. .... Watertown  
 Bauman, Randell E. .... Rapid City  
 Bean, David ..... Sioux Falls  
 Becker, Eldon ..... Pierre  
 Bedingfield, John R., Jr. .... Rapid City  
 Beecher, Mary ..... Madison  
 Behrend, Robert D. .... Sioux Falls  
 \*Behrens, Clayton L. .... Rapid City  
 Belatti, Richard G. .... Madison  
 Bell, Douglas ..... Sioux Falls  
 Bell, Eldon E. .... APO  
 Bell, G. Robert ..... DeSmet  
 Belsaas, Rebecca ..... Rapid City  
 Belyea, Mark ..... Huron  
 Bennett, Jeanne M. .... Rapid City  
 Benson, Gail M. .... Sioux Falls  
 Benson, Margaret ..... Sioux Falls  
 Bentz, Jerome W. .... Platte  
 Berg, Sterling ..... Redfield  
 Berg, Tony L. .... Winner  
 Bergeron, Dale A. .... Rapid City  
 Berkebile, Dale E. .... Rapid City  
 Berry, Jack T. .... Mitchell  
 Berry, Scott H. .... Aberdeen  
 Berry, Spencer ..... Mitchell  
 Bess, Michael A. .... Sioux Falls  
 Bhat, Dileep S. .... Mitchell  
 Bhatara, Vinod ..... Sioux Falls  
 Bieberly, Frank G., Jr. .... Chamberlain  
 Billion, John J. .... Sioux Falls  
 Billion, Stephen P. .... Sioux Falls  
 \*Billion, Thomas J., Jr. .... Sioux Falls  
 Birch, Fredric ..... Rapid City  
 Birkenkamp, Ray T. .... Mitchell  
 Bishop, Donald ..... Sioux Falls  
 Bjordahl, Kevin L. .... Webster  
 Blake, Jerome ..... Sioux Falls  
 \*Bloemendaal, Robert D. .... Rapid City  
 Bloom, Alan ..... Webster  
 Blue, Daniel ..... Sioux Falls  
 Boade, W. Allan ..... Sioux Falls  
 Bochna, Gary S. .... Rapid City  
 Boddicker, Marc E. .... Rapid City

Boice, John L. .... Sioux Falls  
 Bolliger, Eugene ..... Gregory  
 \*Borgmeyer, Henry J. .... Rapid City  
 Bormes, Paul A. .... Rapid City  
 \*Boyce, Raymond A. .... Rapid City  
 Boyd, Rock F. .... Burke  
 Boyer, David W. .... Rapid City  
 Brady, Forrest S. .... Spearfish  
 Braithwaite, Thomas M. .... Sioux Falls  
 \*Branch, Robert F. .... Rapid City  
 Brandenburg, Verdayne .... Sioux Falls  
 \*Bray, Robert B. .... Rapid City  
 Brechtelsbauer, David A. .... Sioux Falls  
 \*Breit, Donald H. .... Sioux Falls  
 Brewer, Marshall L. .... Sioux Falls  
 Broadhurst, Kennon E. .... Aberdeen  
 Brown, Delbert L. .... Sioux Falls  
 Brown, Michael J. .... Spearfish  
 Brown, Russell T. .... Mitchell  
 Bruning, Gary L. .... Flandreau  
 \*Brzica, Stephen M. .... Sioux Falls  
 Bubak, Gary A. .... Wagner  
 Bubak, Mark ..... Sioux Falls  
 Buchholz, Carole ..... Huron  
 Buchholz, Curtis ..... Huron  
 Bucy, Christine R. .... Sioux Falls  
 Buehner, Marvin E. .... Rapid City  
 Buhler, Carey ..... Mitchell  
 Bunker, Thomas G. .... Aberdeen  
 Burdeny, Derek ..... Sioux Falls  
 Burgers, James W. .... Brandon  
 Burnap, Donald W. .... Rapid City  
 Burnett, Raymond G. .... Rapid City  
 Burns, Charles E. .... Sioux Falls  
 Burns, Howard W. .... Sioux Falls  
 \*Burns, Kendall R. .... Sioux Falls  
 Burrish, Gene F. .... Sioux Falls  
 Butz, Gerald W. .... Rapid City  
 Caldwell, Candace ..... Sioux Falls  
 Calhoon, Stephen L. .... Rapid City  
 \*Cameron, Douglas E. .... Rapid City  
 Carlson, Craig L. .... Rapid City  
 Carlson, Gary L. .... Rapid City  
 Carlson, Gregg W. .... Aberdeen  
 Carlson, Walter O. .... Sioux Falls  
 Carpenter, Mary S. .... Winner  
 Carpenter, Paul L. .... Sioux Falls  
 Carr, Deanna L. .... Aberdeen  
 Carrera, Jose ..... Sioux Falls  
 Carroll, Nancy L. .... Sioux Falls  
 \*Carter, Peter B. .... Aberdeen  
 Carter, Roger L. .... Watertown  
 Carver, Richard F. .... Rapid City  
 Cass, Joseph R. .... Sioux Falls  
 Cecil, Daniel P. .... Brookings  
 Chalmers, James H. .... Sioux Falls  
 Chandra, Michael ..... Sioux Falls  
 Chang, Joe P. .... Aberdeen  
 Chavier, Juan R. .... Aberdeen  
 Chicoine, Noel D. .... Pierre  
 Cho, Dong S. .... Sioux Falls  
 Cho, Myung ..... Sioux Falls  
 Christensen, Martin J. .... Mitchell  
 Christensen, Michael W. .... Rapid City

\*Christopher, John ..... Aberdeen  
 Christopherson, Thomas J. .... Sioux Falls  
 Church, Ann K. .... Sioux Falls  
 \*Church, Bill ..... Sioux Falls  
 Cink, Paul ..... Sioux Falls  
 Cink, Thomas M. .... CO  
 Clark, Andrew ..... Gregory  
 \*Clark, Bernard S. .... Spearfish  
 \*Clark, Carroll J. .... Watertown  
 Clark, Edward T. .... Sioux Falls  
 Clement, Kathi ..... Spearfish  
 \*Collins, E. Howard ..... Gettysburg  
 Collins, James D. .... Mobridge  
 Cooper, Greg A. .... Sioux Falls  
 Coppock, Diane ..... Sioux Falls  
 Cornford, Raymond C. .... Rapid City  
 \*Cosand, Marion R. .... AZ  
 Crandell, Michael P. .... Kennebec  
 Crank, Robert N. .... Watertown  
 Crowder, Jay ..... Mitchell  
 Crump, John ..... Sioux Falls  
 Cruse, Joseph R. .... Rapid City  
 Culey, Shawn R. .... Dell Rapids  
 \*Cutshall, Vincent K. .... AR  
 Dahl, Robert K. .... Sioux Falls  
 Davis, John ..... Sioux Falls  
 \*Daw, Edward F. .... CO  
 Day, Richard P. .... Sioux Falls  
 \*Dean, Roscoe ..... AZ  
 Dean, Thomas ..... Wessington Springs  
 DeClark, Robert P. .... Sioux Falls  
 \*DeGeest, James H. .... Miller  
 DeHaan, Douglas ..... Sioux Falls  
 \*Delaney, Robert J. .... Mitchell  
 Delaney, Thomas P. .... Sturgis  
 \*Delaney, William, Jr. .... Mitchell  
 Dendinger, William J. .... Vermillion  
 \*Desai, Bhasker J. .... Watertown  
 Devick, Margaret R. .... Canton  
 Dewald, Allan L. .... Rapid City  
 Dick, Stephen ..... Rapid City  
 Dilger, Joseph T. .... Mitchell  
 Dimitrievich, Elizabeth .... Sioux Falls  
 Doohen, Mark ..... Sioux Falls  
 Dorsey, Robert F. .... Huron  
 Drabek, Gregg A. .... Rapid City  
 Drummond, Ronald G. .... Rapid City  
 Drymalski, Walter G. .... Sioux Falls  
 D'Souza, Edward P. .... Aberdeen  
 Dunlay, Robert W. .... Rapid City  
 Dunst, Jerome ..... Aberdeen  
 Durr, Samuel ..... Rapid City  
 Durst, Robert A., Jr. .... Rapid City  
 Dzintars, Egon F. .... Rapid City  
 \*Dzintars, Paul F. .... Rapid City  
 Dzintars, Valdis A. .... Sioux Falls  
 Easton, Jessie K. M. .... Sioux Falls  
 Ebbert, Larry P. .... Rapid City  
 Eccarius, Scott G. .... Rapid City  
 Eckhoff, P. James ..... Sioux Falls  
 Ecklund, Scott W. .... Sioux Falls  
 Eckrich, Jerome A., Jr. .... Aberdeen



Eckrich, Paul C. .... Aberdeen  
Eidsness, LuAnn ..... Sioux Falls  
\*Eirinberg, Isadore D. .... Sioux Falls  
Elkjer, Neil J. .... Sioux Falls  
Ellerbusch, David A. .... Aberdeen  
Elson, David L. .... Sioux Falls  
\*Elston, John T. .... Rapid City  
Engelbrecht, James A. .... Rapid City  
Engelmann, Gary ..... Miller  
English, Gilbert L. .... Sioux Falls  
\*Ensberg, Dorence L. .... Sioux Falls  
Entwistle, Frederick ..... Sioux Falls  
Ephgrave, Pamela M. .... Sioux Falls  
\*Epp, Dennis L. .... Freeman  
Erickson, David K. .... Dell Rapids  
Erickson, Gregory ..... Sioux Falls  
Erickson, Kirsten ..... Sioux Falls  
Estes, Thomas ..... Sioux Falls

\*Fahrenwald, Myron E. .... Conde  
Falk, Alex ..... Aberdeen  
Famestad, Gary ..... Sioux Falls  
\*Farrell, Harry W. .... Sioux Falls  
Farritor, Michael E. .... Sioux Falls  
Farver, Max ..... Yankton  
\*Fedt, Donald N. .... Watertown  
Feeney, Steven P. .... Watertown  
Fenton, Lawrence J. .... Sioux Falls  
\*Ferrell, Michael R. .... Sioux Falls  
Ferrell, Robert L. .... Rapid City  
Ferrell, Robert T. .... Yankton  
Fetters, Barbara R. .... Hot Springs  
Fiegen, Michael M. .... Sioux Falls  
Fields, Billy ..... Spearfish  
Filler, Elliott W. .... Brookings  
Finley, Richard C. .... Rapid City  
Finley, Robert ..... Rapid City  
Finley, Victoria Koters. .... Rapid City  
Finney, Lawrence W. .... Sioux Falls  
\*Fisk, Robert G. .... Flandreau  
\*Fletcher, Harold J. .... Vermillion  
Flom, Jon O. .... Yankton  
\*Flora, George C. .... Sioux Falls  
Foley, Robert J. .... Tyndall  
Foley, Stephen T. .... Sioux Falls  
Frank, John J. .... Yankton  
Franz, Daniel ..... Rapid City  
Frazer, Paul ..... Sioux Falls  
Free, Thomas ..... Sioux Falls  
Freeman, Jerome W. .... Sioux Falls  
Freimark, Lyle G. .... Rapid City  
\*Friefeld, Saul ..... MN  
Friess, Richard W. .... Sioux Falls  
Fritz, John R. .... Aberdeen  
Fromm, Harold E. .... Rapid City  
Frost, Donald M. .... Sioux Falls  
Frost, Harold L. .... Rapid City  
Frost, James A. .... Rapid City  
Frost, Timothy ..... Rapid City  
Fuller, William C. .... Sioux Falls

Gaede, James E. .... Mitchell  
Gehring, Stephen H. .... Watertown  
Geise, Douglas ..... Sioux Falls  
George, Robert J. .... Sioux Falls

\*Gerber, Bernard C. .... Aberdeen  
Gerber, Jean L. .... Aberdeen  
\*Gere, Richard G. .... Mitchell  
Gerhart, Victoria ..... Dakota Dunes  
Gerrish, Catherine C. .... Watertown  
Gerrish, Edwin S. .... Watertown  
Gesink, Melvin ..... Watertown  
Gibson, Robert ..... Rapid City  
Giebink, Patricia ..... Sioux Falls  
\*Giebink, Robert R. .... Sioux Falls  
\*Gilbert, Freeman J. .... Belle Fourche  
Gill, Timothy J. .... Rapid City  
Gillis, Floyd D., Jr. .... Mitchell  
Gilmore, Howard T. .... Yankton  
Giridhar, Sanjeevi ..... Aberdeen  
Giuseffi, Steven A. .... Spearfish  
Golliher, Warren N. .... Spearfish  
Goodhope, Robert C. .... Fort Meade  
Graff, Randall P. .... Deadwood  
Graham, Donald B. .... Sioux Falls  
Gray, John R. .... Sioux Falls  
Green, Marc A. .... Sioux Falls  
\*Greenfield, Duane L. .... Sioux Falls  
\*Gregg, John B. .... Sioux Falls  
Gregg, Mark ..... Sioux Falls  
Griffin, John ..... Sioux Falls  
Groeger, Thomas ..... Deadwood  
Groote, Curtis A. .... Rapid City  
\*Gross, H. Phil ..... CA  
\*Grove, M. Stuart ..... Sioux Falls  
Gryte, Clifford F. .... Huron  
Guerin, Michael, J. Jr. .... Huron  
Gunderson, Dale E. .... Yankton  
Gunnarson, Richard E. .... Sioux Falls  
\*Gutch, Charley F. .... Sioux Falls  
Gutnik, Leonard M. .... Sioux Falls  
Gutnik, Steve H. .... Sioux Falls  
Gwinn, Charles B. .... Fort Meade

Haas, Stephen N. .... Rapid City  
Habbe, Donald ..... Sioux Falls  
Habib, Nabil ..... Aberdeen  
Hafner, Daniel J. .... Rapid City  
Hagen, Jeffrey B. .... Sioux Falls  
Haley, Michael D. .... Mitchell  
Hall, Barbara ..... Sioux Falls  
Halma, Gary ..... Sioux Falls  
Halverson, Kenneth ..... Yankton  
\*Hamm, Joseph N. .... Sturgis  
Hanna, Marwin ..... Sioux Falls  
Hansen, Craig K. .... Rapid City  
Hansen, Lori ..... Yankton  
Hanson, Bernie H.P. .... Watertown  
Hanson, Charles ..... Rapid City  
Hanson, George R. .... Custer  
Hanson, Jeffrey W. .... Huron  
Hanson, William O. .... Huron  
Hardie, Richard D. .... Sioux Falls  
\*Hare, Helen Jane ..... Rapid City  
Harlow, Mark C. .... Aberdeen  
Harms, Robert W. .... Sioux Falls  
Harris, Frederick L. .... Sioux Falls  
Harris, Mary H. .... Sioux Falls  
Harris, Russell H. .... Sioux Falls  
Hart, Charles E. .... Rapid City

Hart, Harvey J. .... Aberdeen  
Hartmann, Alfred E. .... Sioux Falls  
Hartzell, Allan J. .... Sioux Falls  
Hassan, Adel A.F. .... Madison  
Hata, Steven K. .... Rapid City  
Hayes, Craig R. .... Spearfish  
Hazard, Lorraine ..... IA  
Head, Stephen ..... Mobridge  
Hedges, Craig P. .... Sioux Falls  
Heiling, Karen ..... Sioux Falls  
Heilman, Bernard F. .... Madison  
Heinemann, Daniel J. .... Canton  
Heinemann, Phyllis E. .... Aberdeen  
Heintz, Douglas J. .... Rapid City  
Heisinger, Randolph W. .... Aberdeen  
Held, Gordon ..... GA  
Held, William E. .... Sioux Falls  
Helgaas, Steffen ..... Brookings  
Henderson, Ben J. .... Mobridge  
Henrickson, Lynn A. .... Sioux Falls  
Henrickson, Robert G. .... Sioux Falls

\*Henry, Robert B. .... Brookings  
Henry, Scott D. .... Sioux Falls  
Herbst, John W. .... Rapid City  
Hercules, Costas ..... Rapid City  
Herlihy, John J. .... Rapid City  
\*Hermann, Harland, Sr. .... Rapid City  
Hermann, H. Thomas, Jr. .... Sturgis  
\*Hermanson, John M. .... Brandon  
Herrin, Gerald R. .... Pierre  
Hewitt, Gregory ..... Belle Fourche  
Hibbard, Michael D. .... Sioux Falls  
Hicks, Terry ..... Rapid City  
Hieb, Richard ..... Brookings  
Hill, Laurie ..... Sioux Falls  
Hockett, Richard D. .... Mitchell  
Hof, Jem ..... Yankton  
Hofer, Catherine ..... Sioux Falls  
Hofer, Daryls R. .... Sioux Falls  
\*Hofer, Emil A. .... Huron  
Hoffman, Wendell W. .... Sioux Falls  
Hoffsten, Phillip E. .... Pierre  
Hofmann, Alfred R. .... Rapid City  
Hogue, Michael E. .... Sioux Falls  
Hohm, Byron T. .... Sioux Falls  
Hohm, Paul H. .... Huron  
Hohm, Robert C. .... Huron  
\*Hohm, Theodore A. .... Huron  
Holkesvik, Reid E. .... Aberdeen  
Holland, Lambert W. .... Chamberlain  
Holm, Richard P. .... Brookings  
Holte, Michael J. .... Aberdeen  
Holum, Douglas M. .... Mitchell  
Holzwarth, David R. .... Yankton  
Honke, Richard W., II ..... Parkston  
Honke, Sandra J. .... Rapid City  
Horner, William J. .... Sioux Falls  
Horning, James R. .... Watertown  
Hosen, Richard S. .... Sioux Falls  
Hoskins, John H. .... Sioux Falls  
Hoversten, David L. .... Sioux Falls  
Hovland, James I. .... Aberdeen  
Howard, Richard J. .... Sioux Falls  
Howard, William J. .... Rapid City  
Howe, Jerome K. .... Mitchell  
Hoxtell, Eugene O. .... Sioux Falls

Huber, Joel B. .... Redfield  
 Huber, Thomas J. .... Pierre  
 Hubner, Jay W. .... Yankton  
 \*Huet, William G.M. .... Huron  
 Humphreys, Donald W. .... Sioux Falls  
 Huot, Samuel W. .... Rapid City  
 \*Huppler, Edward G. .... MN  
 Hurley, Brian T. .... Sioux Falls  
 Hurley, Dominic .... Sioux Falls  
 Hurley, Timothy E. .... Sioux Falls  
 Hussain, Rif'at .... Sioux Falls  
 Hyland, Lowell J. .... Sioux Falls

Ingvoldstad, James P. .... Sioux Falls  
 Isburg, Carroll D. .... Yankton  
 Iverson, Gregory J. .... Rapid City

Jackson, James W. .... Rapid City  
 Jacobs, Tad B. .... Flandreau  
 Jacobson, Theodore R. .... Hot Springs  
 \*Jahraus, R. Curtis .... Pierre  
 \*James, Edward H. .... Rapid City  
 Jameson, G. Malcolm .... Yankton  
 \*Janavs, Visvaldis .... FL  
 \*Janis, John B. .... Sioux Falls  
 Janss, Gerti J. .... Rapid City  
 Janusz, Albin J. .... Aberdeen  
 Jaqua, Richard A. .... Sioux Falls  
 Jassim, Ali D. .... Sioux Falls  
 Jenny, David .... Yankton  
 Jenter, George W. .... Sturgis  
 Jentes, Paul K. .... Sturgis  
 Jerde, O. Myron .... Rapid City  
 Jerstad, John P. .... Sioux Falls  
 Johnson, Daniel C. .... Yankton  
 Johnson, Dave R. .... Rapid City  
 \*Johnson, Edward A. .... Milbank  
 Johnson, Jorge H. .... Sioux Falls  
 Johnson, Kenneth M. .... Watertown  
 Johnson, Mark W. .... Sioux Falls  
 Johnson, Paul S. .... Rapid City  
 Johnson, R.C. .... Sioux Falls  
 Johnson, Robert K. .... Rapid City  
 Johnson, Thomas C. .... Brookings  
 Johnson, Virginia P. .... Vermillion  
 Jones, D. Brynley .... Platte  
 Jones, James A. .... Watertown  
 Jones, John B. .... Chamberlain  
 Jones, Warren L. .... Sioux Falls  
 \*Jones, William E. .... Sturgis  
 \*Judge, John O. .... AZ  
 Justice, Michael W. .... Dell Rapids

Kafka, Richard .... Gregory  
 \*Kalda, Ellison F. .... Platte  
 Kalda, Ellison F., II .... Sioux Falls  
 Kangley, Daniel J. .... Sioux Falls  
 Kannan, Hari D. .... Sioux Falls  
 Kaplan, Richard .... Yankton  
 Kapur, Hiroo R. .... Huron  
 Kapur, Ravi .... Huron  
 Karl, Stephen, R. .... Sioux Falls  
 Karlen, Louis W. .... DeSmet

Kass, Joseph .... Rosholt  
 Kaufman, Irvin I. .... Freeman  
 Kavanaugh, Kevin .... Sioux Falls  
 Keegan, James M. .... Rapid City  
 \*Kelley, Donald H. .... Deadwood  
 Kelts, K. Alan .... Rapid City  
 Kemp, Earl D. .... Sioux Falls  
 Kennelly, Daniel J. .... Sioux Falls  
 Keppen, Bruce .... Aberdeen  
 Keppen, Laura .... Sioux Falls  
 Keppen, Michael .... Sioux Falls  
 Kerr, James .... Yankton  
 Kihne, Michael .... Sioux Falls  
 \*King, Lyndon M., Jr .... Sioux Falls  
 King, Patrick H. .... Yankton  
 Kinton, Kenneth .... Freeman  
 Kitowski, Theodore .... Brookings  
 \*Kittelson, H. Otis .... Sioux Falls  
 \*Klar, Werner .... Fort Meade  
 Knecht, John F. .... Martin  
 \*Knowles, Roy C. .... Sioux Falls  
 Knowles-Smith, Peter .... ND  
 Knudson, Donald H. .... Sioux Falls  
 Knutson, Dennis D. .... Sioux Falls  
 Knutson, Roger S. .... Rapid City  
 Kom, Carlton J. .... Aberdeen  
 Kontos, George J., Jr .... Sioux Falls  
 Koob, K. Gene .... Sioux Falls  
 \*Koren, Paul H. .... Rapid City  
 Kosina, Thomas .... Winner  
 Kosse, Karl H. .... Aberdeen  
 Kovacs, Stephen J. .... Sioux Falls  
 Kovarik, Joseph A. .... Rapid City  
 \*Kovarik, Richard A. .... Rapid City  
 Kovarik, Stephen M. .... Rapid City  
 \*Kovarik, Wenzel J. .... Rapid City  
 Krafka, Thomas L. .... Rapid City  
 Krishnamoorthy, A. .... Faulkton  
 Krizan, Kelly J. .... Pierre  
 Krohn, David C. .... Yankton  
 Kuck, Paul .... ND  
 Kummer, Mark .... Sioux Falls  
 Kundel, David .... Mitchell  
 Kundel, Robert R. .... Chamberlain  
 Kunkel, Shirley .... Sioux Falls  
 Kunkel, Steve .... Sioux Falls  
 Kunz, James A. .... Rapid City  
 Kurch, Julie Ann .... Huron  
 Kutayli, Farid .... Sioux Falls  
 Kwan, Francis P. .... Rapid City

Lakstigala, Peters E. .... Sioux Falls  
 Lamb, Marlin R. .... Watertown  
 \*Lampert, Arthur A., Jr .... Rapid City  
 \*Lampert, Arthur A., Sr .... Rapid City  
 Landreth, Knute, Jr. .... Huron  
 Lang, Terry A. .... Sioux Falls  
 Lankhorst, Barry J. .... Sioux Falls  
 Laput, Aleksandra M. .... Sioux Falls  
 \*Lardinois, Clifford C., Sr .... Huron  
 Larsen, David .... Sioux Falls  
 Larsen, Laura J.R. .... Sioux Falls  
 Larson, James C. .... Watertown  
 Larson, Leland J. .... Sioux Falls  
 Larson, Paul M. .... Watertown

Lauer, David A. .... Sturgis  
 Lawler, Patrick J. .... Sioux Falls  
 \*Lee, Si Gaph .... AZ  
 Leland, Dennis G. .... Mitchell  
 Lele, Shrirang M. .... Huron  
 \*Leon, Paul R. .... Aberdeen  
 Lewis, Charles A. .... Sturgis  
 Liedtke, Curtis J. .... Sturgis  
 Likness, Clark W. .... Watertown  
 Lindbloom, Brent .... Pierre  
 Lindbloom, Buron O. .... Pierre  
 Linde, Leonard M. .... Mobridge  
 Linn, Bernard .... Pierre  
 Liudahl, Jeffrey .... Yankton  
 Lockwood, William W. .... Sioux Falls  
 Loewen, Nathan H. .... Huron  
 Looby, Thomas L. .... Sioux Falls  
 Loos, Charles M. .... Rapid City  
 Loperena, Rudolf .... Wagner  
 Lopez, Alberto S. .... Hot Springs  
 Lord, Charles J. .... Rapid City  
 Lorenzen, Kim .... Mitchell  
 Lovrien, Fred C. .... Sioux Falls  
 Luebke, Marlys .... Corsica  
 Lushbough, Bruce C. .... Brookings  
 Lustig, Karl A. .... Spearfish  
 Luzier, Thomas L. .... Aberdeen  
 Lynch, Patrick .... Aberdeen  
 \*Lyso, Melford B. .... Sioux Falls

Mabee, Judson O. .... Mitchell  
 Mabee, Lee M. .... Sioux Falls  
 Mabee, Mark J. .... Yankton  
 \*Mabee, Oscar J. .... Mitchell  
 MacDougall, James .... Aberdeen  
 MacRandall, Daniel G. .... Sioux Falls  
 Madison, Dean L. .... Sioux Falls  
 Magidson, Melvin A. .... Sioux Falls  
 Magnuson, Gregory L. .... Sioux Falls  
 Mahnke, Mark W. .... Sioux Falls  
 Malek, Michel .... Aberdeen  
 Mallek, John A. .... Sioux Falls  
 Malm, John A. .... Gregory  
 Malters, David T. .... Mitchell  
 Malters, Patricia B. .... Mitchell  
 Mangulis, George J. .... Philip  
 Manlove, Stephen .... Rapid City  
 Mannes, Bruce .... Yankton  
 Margallo, Lucio N., II .... Mitchell  
 Mark, Curtis L. .... Viborg  
 Marten, Brian R. .... Sioux Falls  
 Massopust, Steven .... Rapid City  
 Masterson, Thomas E. .... Sioux Falls  
 Mathews, Michael J. .... Rapid City  
 \*Mattson, William J. .... Rapid City  
 Matushin, Clifford, M. .... Huron  
 Mayo, Chester W.P. .... Aberdeen  
 McCafferty, James D. .... Rapid City  
 McClafflin, Richard .... Sioux Falls  
 McFadden, Raymond J. .... Gettysburg  
 McFee, John .... Bowdle  
 \*McGee, Robert C. .... Aberdeen  
 McGrann, James R. .... Sioux Falls  
 McGreevy, Patrick S. .... Sioux Falls  
 \*McGuigan, Patrick .... Rapid City



\*McHardy, Bryson R. .... Aurora  
 \*McIntosh, George F. .... Eureka  
 McKenzie, Mark K. .... Mitchell  
 McKercher, Scott W. .... Sioux Falls  
 McKichan, John M. .... Aberdeen  
 McLaughlin, Ruth M. .... Deadwood  
 McMillin, J. Michael .... Sioux Falls  
 McVay, Michael R. .... Yankton  
 McWhirter, Robert E. .... Mitchell  
 Megard, Daniel J. .... Yankton  
 Mendoza, Eric F. .... Aberdeen  
 \*Merryman, Murlin P. .... Rapid City  
 Messner, Frank D. .... Yankton  
 Meyer, Larry A. .... Yankton  
 Meyer, Robert D. .... Sioux Falls  
 \*Meyer, Robert J. .... Watertown  
 Meyer, Vaughn H. .... Sioux Falls  
 Mikkelsen, Beth .... Sioux Falls  
 Millea, Roger P. .... Rapid City  
 Milroy, Mary J. .... Yankton  
 Minton, Timothy P. .... Rapid City  
 Mitchel, Pat W. .... Burke  
 Moench, Jerry L. .... Sioux Falls  
 Mogen, Mark P. .... Aberdeen  
 Mohama, Riyadh .... Sioux Falls  
 Mohler, Charles W. .... Sioux Falls  
 Monfore, James E. .... Armour  
 Monson, Charles D. .... Parkston  
 Morgan, Timothy J. .... Sioux Falls  
 Morris, Alan D. .... Sioux Falls  
 Mortimer, Sam L. .... Rapid City  
 \*Mueller, Eric H. .... Tripp  
 Munson, David P. .... Sioux Falls  
 \*Munson, H. Benjamin .... Rapid City  
 Murphy, Karla K. .... Sioux Falls  
 Murray, Jeffrey A. .... Sioux Falls  
 Mutch, Milton G., Jr. .... Sioux Falls

Nagelhout, David .... Sioux Falls  
 Naughton, Gregory .... Sioux Falls  
 Nedved, Lonnie J. .... Mitchell  
 Neidich, Gary A. .... Sioux Falls  
 Nelimark, Robert A. .... Sioux Falls  
 Nelsen, Marcia .... Yankton  
 Nelson, Earl G. .... Watertown  
 Nelson, Lawrence F. .... Webster  
 Nelson, Patrick A. .... Sioux Falls  
 Nelson, Richard A. .... Sioux Falls  
 Nelson, Robert E. .... Sioux Falls  
 Nemer, Raymond G. .... Gregory  
 Nesbit, Dennis .... Rapid City  
 Neu, Norman D. .... Rapid City  
 Neubauer, Jo Marie .... Yankton  
 Neumayr, Robert J. .... Yankton  
 Nice, Richard F. .... Sioux Falls  
 Nicholas, George A. .... Huron  
 Nicholson, Peter J. .... Wagner  
 Nielsen, James L. .... Dell Rapids  
 Nipe, Hollis .... Watertown  
 Nixon, Robert B. .... Rapid City  
 \*Nolan, Bernard P. .... MN  
 Nord, Allen E. .... Rapid City  
 Nord, Wesley J. .... Sioux Falls  
 Nordstrom, Donald G. .... Sioux Falls  
 Nussbaum, David .... Sioux Falls

Oakland, James A. .... Sioux Falls  
 O'Brien, Charles P. .... Sioux Falls  
 O'Brien, Kristin .... Rapid City  
 O'Brien, Peter J. .... Sioux Falls  
 Ochsner, John A. .... Sioux Falls  
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# North Central Heart Institute

## ELEVENTH ANNUAL FALL SYMPOSIUM

**FRIDAY, OCTOBER 22, 1993**

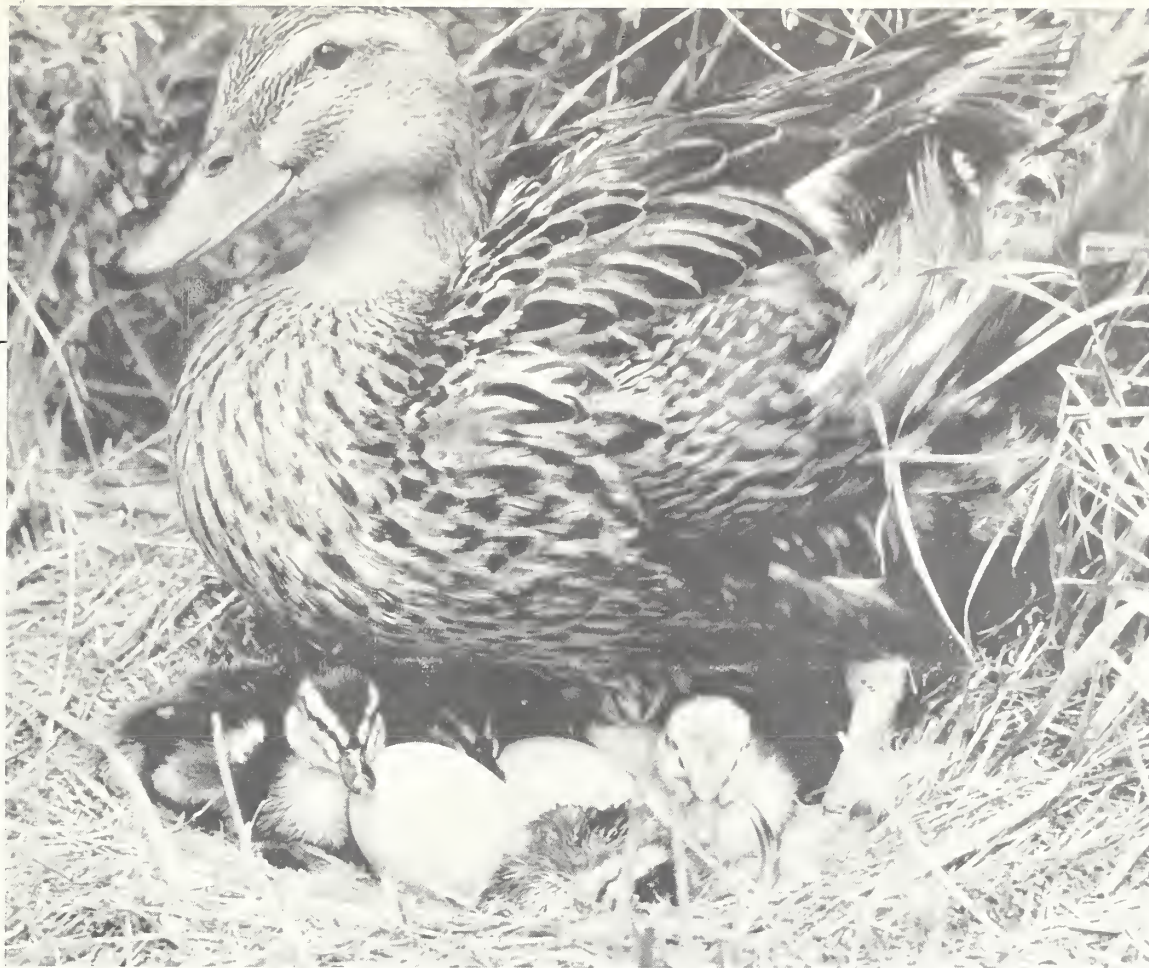
You are cordially invited to our Fall Symposium to be held at the Ramkota Inn Convention Center in Sioux Falls, SD on October 22, 1993. Nationally recognized speakers will discuss cardiovascular topics and how they relate to your every day practice of medicine. Some of the topics planned include:

- **Geriatric Cardiology**
- **Treatment of Arrhythmias**
- **Stress Echocardiography**
- **Anticoagulation**
- **Thrombolytic Therapy**
- **Post Myocardial Infarction Therapy**
- **Treatment Selection for Hypertension**
- **Thoracoscopy**
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We would especially like to welcome our new partner, Dr. Rick Backes, who recently joined our consulting staff. He trained at the Mayo Clinic, and we are very pleased to have him with us. Dr. Backes has agreed to speak at our symposium. For the past 12 years, NCH has been on the leading edge of cardiovascular care and we will continue to provide the highest quality of care that you have come to expect.

Registration materials will be available in mid-August. For more information regarding the upcoming symposium or any of our services, please call (605) 331-5394.



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Volume 46/No. 9 September 1993

(ISSN 0038-3317)

Official Publication of the  
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American College of Surgeons  
the South Dakota Psychiatric Association  
of the American Psychiatric Association

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NATIONAL ADVERTISING: Contact State Medical Journal Advertising Bureau, Inc, 711 South Boulevard, Oak Park, Illinois 60302. Phone: 708-383-8800.

LOCAL AND CLASSIFIED ADS: Contact Jeri Spars, SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Phone: 605-336-1965.

PRINTER: The Ovid Bell Press, Inc, PO Box 370, Fulton, Missouri 65251-0370.

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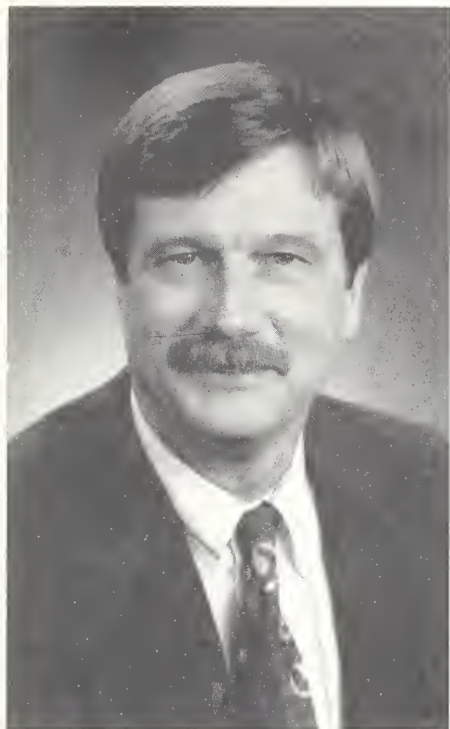
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**Thomas L. Krafka, MD, President  
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September is Women in Medicine Month, a fact I have been reminded of by several people (women). Since nothing is happening in Health System Reform and I had nothing else planned, Women in Medicine will be the subject for this President's Page. (Just kidding, Mary)

First, the statistics: At the end of 1992 there were 653,000 physicians in the United States of which 18% or 118,500 are female; by 2010, 30% will be. Currently, 40% of medical students are female and in South Dakota it is more than 50%. Of the 118,500 female physicians, 40% are less than 35 years old, another 40% less than 44, and 60% are in primary care specialties. Female physicians work 10% fewer hours than their male counterparts and earn significantly less apparently secondary to a combination of factors: they are more likely to be in lower paid specialties, more likely to be employed, work fewer hours, see fewer patients and are younger. Nationwide women are less likely to be involved with organized medicine with only 30% belonging to the AMA, although, in South Dakota 50% belong to the AMA, nearly the same as for male physicians.

Traditionally, the way to be a "good doctor" was to be a workaholic and do little else except for medicine. To be accepted, a female physician had to work as hard or

harder than male physicians and woe to those who could not or did not want to keep up the pace or, heaven forbid, got pregnant. Increased numbers of women in medicine have helped to bring focus on inhumane residency programs and have brought practices arranged to allow for more time for family and pastimes. Female physicians also tend to see fewer patients and take more time with each patient. We all have the challenge to reconcile the traditional views of the physician as an all consuming career with that of wife and mother. Changing the system to accommodate motherhood will also make it easier for male physicians to be better husbands and fathers.

We male physicians must also recognize the problem of sexual harassment which is reported by 50%-60% of female medical students and residents. This number is even higher with nurses, x-ray techs, etc. The position of a male physician in hospital hierarchy may be intimidating to females who are subjected to sexual harassment. We must be especially sensitive to those situations where harassment may occur.

The increased number of female physicians means male physicians and especially we "older" male physicians must accept change in attitudes and practices. We can learn from the traditionally female traits of compassion, understanding and care giving to help us become better physicians. The attitudes women bring to medicine may also be more compatible with the change we will experience with Health Care Reform. I think my attitudes are changing (slowly) and if I can change, probably anyone can.

**Happy Women in Medicine Month!**

*Thomas L Krafka MD*



## Perspectives on Drug Interactions

Janet Fischer, Pharm.D, Sioux Falls

Interactions between drugs have been recognized since the 1940's. Since that time the number of known drug interactions has grown so much that there are reference texts devoted specifically to the subject. The increase is related to both an increase in the number of drugs on the market, and increased efforts to identify interactions through controlled trials. Despite this heightened interest and awareness, prescribers are faced with an extremely difficult task in trying to apply this information in the clinical setting. The following case illustrates some of the reasons for this difficulty.

Recently a 58 year old patient was admitted to the hospital with a five day history of nausea, diarrhea, jitteriness, dizziness, and anorexia. The patient was known to have end state COPD and on admission was discovered to have a theophylline level of 35 mcg/ml (therapeutic range 10-20 mcg/ml). He had been taking theophylline for over 5 years, and on a stable dose with therapeutic levels for the past 6 months. With discontinuation of the theophylline and administration of activated charcoal, his level fell to 6.6 mcg/ml within 24 hours and he had no serious sequelae. The obvious question that arose was the cause of the theophylline toxicity. The patient reported good compliance with his regimen and his liver function tests were normal. The only change in his regimen was the addition of tetracycline 8 days prior to admission for treatment of increased sputum production. Standard pharmacy and pharmacology references did not indicate an interaction between the two drugs, but a review of the primary literature did reveal one case report similar to this.<sup>1</sup> Three small pharmacokinetic studies reported only small reductions in theophylline clearance by tetracycline, and concluded that the clinical risk of using the two drugs together is minimal.<sup>2,3,4</sup> This case aptly demonstrates the inter-patient variation in drug interactions, as well as the fact that even though the average effect on a population may be negligible, the individual impact may be great indeed.

What can be learned about drug interactions from this episode, and how can practitioners utilize the information available without memorizing long lists of interacting drugs?

First of all, this scenario illustrates the often unexpected nature of drug interactions. Even the most diligent practitioner could not have predicted that an interaction between theophylline and tetracycline might occur. Earlier reporting of symptoms by the patient, however, might have resulted in more rapid

detection of the problem and avoidance of a hospital admission. The importance of patient education, and particularly repetitious education, may be the key. Though the patient may have learned about the side effects of theophylline when he first started the drug, that was five years prior. Repeated education with each clinic visit, medication refill, and hospital admission is a vital component of care, particularly with the use of medications with narrow therapeutic indexes, serious side effects, or multiple drug interactions.

Secondly and equally important, practitioners need a practical way to recall and detect clinically significant drug interactions. Memorization is virtually impossible, and unfortunately many of the computer programs designed to do this are unable to separate significant from insignificant interactions. A systematic approach that relies on a basic knowledge of pharmacology can be used to help identify at least the most common and serious drug interactions.

Pharmacodynamic interactions, those involving drugs with additive or antagonistic effects, are the easiest to spot. Virtually all practitioners know that beta blockers can antagonize beta agonists, and that two vasodilators will have additive effects on blood pressure. Some are less obvious, however, and may require knowledge of precise cellular and biochemical mechanisms. A good example is the drug adenosine. Its action is blocked by theophylline, due to its adenosine receptor blocking effects, and is enhanced by dipyridamole, by blocking adenosine's cellular uptake and metabolism. Still, practitioners who keep up with changes in pharmacology and take the time to learn the pharmacology of new agents should be able to recognize most pharmacodynamic interactions.

The more difficult interactions to detect are pharmacokinetic - those that involve alterations in the body's handling of a drug. Though pharmacology texts often contain long lists of drugs with pharmacokinetic interactions, it is important to realize that only a small portion of these are clinically significant. An interaction that enhances the effect of a drug with a wide margin of safety, such as a cephalosporin or an H<sub>2</sub> blocker, seldom has clinical importance. The drugs of primary concern are those with a narrow therapeutic index or serious side effects. This would include drugs such as digoxin, warfarin, heparin, lithium, theophylline, phenytoin, to name a few. Small changes, either up or down, in the serum or tissue levels of these drugs could cause significant problems for a patient. The key to avoiding problems is not to try to remember all the interactions these drugs have, but just to recognize that they are drugs with significant risk. Then when changes are made in the drug regimens of patients who are receiving any of these high risk medications, ap-

propriate references can be consulted to determine the likelihood of an interaction.

Another key step is to be familiar with medications whose pharmacokinetic profiles make them more susceptible to interactions. This would include medications that are highly protein bound, such as warfarin and phenytoin, and those that are metabolized by the cytochrome P-450 system, such as benzodiazepines, theophylline, warfarin, and many anticonvulsants. In addition, it is important to recognize those drugs that either enhance or impair the activity of the cytochrome P-450 system, such as rifampin and anticonvulsants which enhance, and erythromycin, ciprofloxacin, and cimetidine, which impair. Familiarity with these drugs and the uniqueness of their pharmacokinetic profiles should alert prescribers to potential problems and prompt a review of references or a call to a pharmacist when they are used.

These general steps can help all practitioners recognize when patients are at risk of experiencing a drug interaction. The fact that two drugs have a significant interaction does not mean they cannot be used together, but usually implies the need for dosage adjustment or additional monitoring. It is also important to remember that problems can occur both when an interacting drug is added to the regimen, as well as when it is discontinued. Routine review of patients' medication

profiles and changes that have been made is a necessity to detect and avoid problems. Overall, a good working knowledge of pharmacology, a high index of suspicion, and the use of reference texts when uncertainty exists, should help all practitioners to identify potential interactions and avoid problems.

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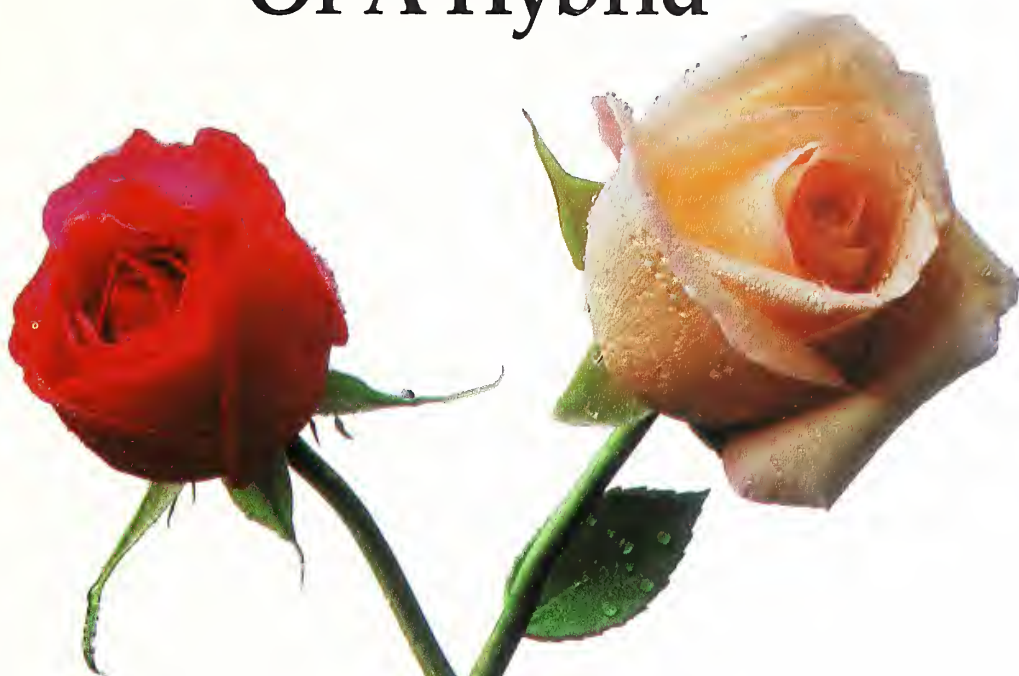
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medications. Minimizes insurance copayments. And minimizes potassium supplementation.

A hybrid *blending of tolerability and power* that's available for the right patient. Vaseretic is indicated for the treatment of hypertension in patients for whom combination therapy is appropriate.

And an elegant discovery for your practice.

**USE IN PREGNANCY:** When used in pregnancy during the second and third trimesters, ACE inhibitors can cause injury and even death to the developing fetus. When pregnancy is detected, Vaseretic<sup>®</sup> (Enalapril Maleate-Hydrochlorothiazide) should be discontinued as soon as possible. See WARNINGS, Fetal/Neonatal Morbidity and Mortality.

**VASERETIC<sup>®</sup> 10-25** *Next*  
Enalapril Maleate-Hydrochlorothiazide

Dosage must be individualized; the fixed combination is not for initial therapy. Evaluation of the hypertensive patient should always include assessment of renal function.

For a Brief Summary of Prescribing Information, see adjacent pages.



**TABLETS  
VASERETIC  
(ENALAPRIL MALEATE-HYDROCHLOROTHIAZIDE)**

**USE IN PREGNANCY:** When used in pregnancy during the second and third trimesters, ACE inhibitors can cause injury and even death to the developing fetus. When pregnancy is detected, VASERETIC (Enalapril Maleate-Hydrochlorothiazide) should be discontinued as soon as possible. See WARNINGS, Fetal/Neonatal Morbidity and Mortality.

**CONTRAINDICATIONS:** VASERETIC is contraindicated in patients who are hypersensitive to any component of this product and in patients with a history of angioedema related to previous treatment with an angiotensin converting enzyme inhibitor. Because of the hydrochlorothiazide component, this product is contraindicated in patients with anuria or hypersensitivity to other sulfonamide-derived drugs.

**WARNINGS:** General, Enalapril Maleate, Hypotension: Excessive hypotension was rarely seen in uncomplicated hypertensive patients but is a possible consequence of enalapril use in severely salt/volume depleted persons such as those treated vigorously with diuretics or patients on dialysis.

Syncope has been reported in 1.3 percent of patients receiving VASERETIC. In patients receiving enalapril alone, the incidence of syncope is 0.5 percent. The overall incidence of syncope may be reduced by proper titration of the individual components. (See PRECAUTIONS, Drug Interactions, and ADVERSE REACTIONS.)

In patients with severe congestive heart failure, with or without associated renal insufficiency, excessive hypotension has been observed and may be associated with oliguria and/or progressive azotemia, and rarely with acute renal failure and/or death. Because of the potential fall in blood pressure in these patients, therapy should be started under very close medical supervision. Such patients should be followed closely for the first two weeks of treatment and whenever the dose of enalapril and/or diuretic is increased. Similar considerations may apply to patients with ischemic heart or cerebrovascular disease, in whom an excessive fall in blood pressure could result in a myocardial infarction or cerebrovascular accident.

If hypotension occurs, the patient should be placed in the supine position and, if necessary, receive an intravenous infusion of normal saline. A transient hypotensive response is not a contraindication to further doses, which usually can be given without difficulty once the blood pressure has increased after volume expansion.

**Angioedema:** Angioedema of the face, extremities, lips, tongue, glottis and/or larynx has been reported in patients treated with angiotensin converting enzyme inhibitors, including enalapril. In such cases VASERETIC should be promptly discontinued and appropriate therapy and monitoring should be provided until complete and sustained resolution of signs and symptoms has occurred. In instances where swelling has been confined to the face and lips the condition has generally resolved without treatment, although antihistamines have been useful in relieving symptoms. Angioedema associated with laryngeal edema may be fatal. Where there is involvement of the tongue, glottis or larynx, likely to cause airway obstruction, appropriate therapy, e.g., subcutaneous epinephrine solution 1:1000 (0.3 mL to 0.5 mL) and/or measures necessary to ensure a patent airway, should be promptly provided. (See ADVERSE REACTIONS.)

Patients with a history of angioedema unrelated to ACE inhibitor therapy may be at increased risk of angioedema while receiving an ACE inhibitor (see also CONTRAINDICATIONS).

**Neutropenia/Agranulocytosis:** Another angiotensin converting enzyme inhibitor, captopril, has been shown to cause agranulocytosis and bone marrow depression, rarely in uncomplicated patients but more frequently in patients with renal impairment especially if they also have a collagen vascular disease. Available data from clinical trials of enalapril are insufficient to show that enalapril does not cause agranulocytosis at similar rates. Marketing experience has revealed several cases of neutropenia or agranulocytosis in which a causal relationship to enalapril cannot be excluded. Therefore, monitoring of white blood cell counts in patients with collagen vascular disease and renal disease should be considered.

**Hydrochlorothiazide:** Thiazides should be used with caution in severe renal disease. In patients with renal disease, thiazides may precipitate azotemia. Cumulative effects of the drug may develop in patients with impaired renal function.

Thiazides should be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma.

Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma.

The possibility of exacerbation or activation of systemic lupus erythematosus has been reported.

Lithium generally should not be given with thiazides (see PRECAUTIONS, Drug Interactions, Enalapril Maleate and Hydrochlorothiazide).

**Pregnancy:** Enalapril-Hydrochlorothiazide: There was no teratogenicity in rats given up to 90 mg/kg/day of enalapril (150 times the maximum human dose) in combination with 10 mg/kg/day of hydrochlorothiazide (2 1/2 times the maximum human dose) or in mice given up to 30 mg/kg/day of enalapril (50 times the maximum human dose) in combination with 10 mg/kg/day of hydrochlorothiazide (2 1/2 times the maximum human dose). At these doses, fetotoxicity expressed as a decrease in average fetal weight occurred in both species. No fetotoxicity occurred at lower doses, 30/10 mg/kg/day of enalapril-hydrochlorothiazide in rats and 10/10 mg/kg/day of enalapril-hydrochlorothiazide in mice.

When used in pregnancy during the second and third trimesters, ACE inhibitors can cause injury and even death to the developing fetus. When pregnancy is detected, VASERETIC should be discontinued as soon as possible. (See Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality, below.)

**Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality:** ACE inhibitors can cause fetal and neonatal morbidity and death when administered to pregnant women. Several dozen cases have been reported in the world literature. When pregnancy is detected, ACE inhibitors should be discontinued as soon as possible.

The use of ACE inhibitors during the second and third trimesters of pregnancy has been associated with fetal and neonatal injury, including hypotension, neonatal skull hypoplasia, anuria, reversible or irreversible renal failure, and death. Oligohydramnios has also been reported, presumably resulting from decreased fetal renal function; oligohydramnios in this setting has been associated with fetal limb contractures, craniofacial deformation, and hypoplastic lung development. Prematurity, intrauterine growth retardation, and patent ductus arteriosus have also been reported, although it is not clear whether these occurrences were due to the ACE-inhibitor exposure.

These adverse effects do not appear to have resulted from intrauterine ACE-inhibitor exposure that has been limited to the first trimester. Mothers whose embryos and fetuses are exposed to ACE inhibitors only during the first trimester should be so informed. Nonetheless, when patients become pregnant, physicians should make every effort to discontinue the use of VASERETIC as soon as possible.

Rarely (probably less often than once in every thousand pregnancies), no

10  
mg

10  
mg

VASERETIC

25  
mg

alternative to ACE inhibitors will be found. In these rare cases, the mothers should be apprised of the potential hazards to their fetuses, and serial ultrasound examinations should be performed to assess the intraamniotic environment.

If oligohydramnios is observed, VASERETIC should be discontinued unless it is considered lifesaving for the mother. Contraction stress testing (CST), a non-stress test (NST), or biophysical profiling (BPP) may be appropriate, depending upon the week of pregnancy. Patients and physicians should be aware, however, that oligohydramnios may not appear until after the fetus has sustained irreversible injury.

Infants with histories of *in utero* exposure to ACE inhibitors should be closely observed for hypotension, oliguria, and hyperkalemia. If oliguria occurs, attention should be directed toward support of blood pressure and renal perfusion. Exchange transfusion or dialysis may be required as means of reversing hypotension and/or substituting for disordered renal function. Enalapril, which crosses the placenta, has been removed from neonatal circulation by peritoneal dialysis with some clinical benefit, and theoretically may be removed by exchange transfusion, although there is no experience with the latter procedure.

No teratogenic effects of enalapril were seen in studies of pregnant rats, and rabbits. On a mg/kg basis, the doses used were up to 333 times (in rats), and 50 times (in rabbits) the maximum recommended human dose. **Hydrochlorothiazide, Teratogenic Effects:** Reproduction studies in the rabbit, the mouse and the rat at doses up to 100 mg/kg/day (50 times the human dose) showed no evidence of external abnormalities of the fetus due to hydrochlorothiazide. Hydrochlorothiazide given in a two-liter study in rats at doses of 4-5.6 mg/kg/day (approximately 1-2 times the usual daily human dose) did not impair fertility or produce birth abnormalities in the offspring. Thiazides cross the placental barrier and appear in cord blood.

**Nonteratogenic Effects:** These may include fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions which have occurred in the adult.

**PRECAUTIONS:** General, Enalapril Maleate, Impaired Renal Function: As a consequence of inhibiting the renin-angiotensin-aldosterone system, changes in renal function may be anticipated in susceptible individuals. In patients with severe congestive heart failure whose renal function may depend on the activity of the renin-angiotensin-aldosterone system, treatment with angiotensin converting enzyme inhibitors, including enalapril, may be associated with oliguria and/or progressive azotemia and rarely with acute renal failure and/or death.

In clinical studies in hypertensive patients with unilateral or bilateral renal artery stenosis, increases in blood urea nitrogen and serum creatinine were observed in 20 percent of patients. These increases were almost always reversible upon discontinuation of enalapril and/or diuretic therapy. In such patients renal function should be monitored during the first few weeks of therapy.

Some patients with hypertension or heart failure with no apparent pre-existing renal vascular disease have developed increases in blood urea and serum creatinine, usually minor and transient, especially when enalapril has been given concomitantly with a diuretic. This is more likely to occur in patients with pre-existing renal impairment. Dosage reduction of enalapril and/or discontinuation of the diuretic may be required.

**Evaluation of the hypertensive patient should always include assessment of renal function.**

**Hemodialysis Patients:** Anaphylactoid reactions have been reported in patients dialyzed with high-flux membranes (e.g., AN 69) and treated concomitantly with an ACE inhibitor. In these patients consideration should be given to using a different type of dialysis membrane or a different class of antihypertensive agent.

**Hyperkalemia:** Elevated serum potassium (greater than 5.7 mEq/L) was observed in approximately one percent of hypertensive patients in clinical trials treated with enalapril alone. In most cases these were elevated values which resolved despite continued therapy, although hyperkalemia was a cause of discontinuation of therapy in 0.28 percent of hypertensive patients. Hyperkalemia was less frequent (approximately 0.1 percent) in patients treated with enalapril plus hydrochlorothiazide. Risk factors for the development of hyperkalemia include renal insufficiency, diabetes mellitus, and the concomitant use of potassium-sparing diuretics, potassium supplements and/or potassium-containing salt substitutes, which should be used cautiously, if at all, with enalapril. (See Drug Interactions.)

**Cough:** Cough has been reported with the use of ACE inhibitors. Characteristically, the cough is nonproductive, persistent and resolves after discontinuation of therapy. ACE inhibitor-induced cough should be considered as part of the differential diagnosis of cough.

**Surgery/Anesthesia:** In patients undergoing major surgery or during anesthesia with agents that produce hypotension, enalapril may block angiotensin II formation secondary to compensatory renin release. If hypotension occurs and is considered to be due to this mechanism, it can be corrected by volume expansion.

**Hydrochlorothiazide:** Periodic determination of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals. All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance: hyponatremia, hypochloremic alkalosis, and hypokalemia. Serum and urine electrolyte determinations are particularly important when the patient is vomiting excessively or receiving parenteral fluids. Warning signs or symptoms of fluid and electrolyte imbalance, irrespective of cause, include dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, confusion, seizures, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting.

Hyperkalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or after prolonged therapy. Interference with adequate oral electrolyte intake will also contribute to hyperkalemia. Hyperkalemia may cause cardiac arrhythmia and may also sensitize or exaggerate the response of the heart to the toxic effects of digitalis (e.g., increased ventricular irritability). Because enalapril reduces the production of aldosterone, concomitant therapy with enalapril attenuates the diuretic-induced potassium loss (see Drug Interactions, Agents Increasing Serum Potassium).

Although any chloride deficit is generally mild and usually does not require specific treatment except under extraordinary circumstances (as in liver disease or renal disease), chloride replacement may be required in the

treatment of metabolic alkalosis.

Dilutional hyponatremia may occur in edematous patients in hot weather; appropriate therapy is water restriction, rather than administration of salt except in rare instances when the hyponatremia is life-threatening. In actual salt depletion, appropriate replacement is the therapy of choice.

Hyperuricemia may occur or frank gout may be precipitated in certain patients receiving thiazide therapy.

In diabetic patients dosage adjustments of insulin or oral hypoglycemic agents may be required. Hyperglycemia may occur with thiazide diuretics. Thus latent diabetes mellitus may become manifest during thiazide therapy.

The antihypertensive effects of the drug may be enhanced in the postsympathetic patient.

If progressive renal impairment becomes evident consider withholding or discontinuing diuretic therapy.

Thiazides have been shown to increase the urinary excretion of magnesium, this may result in hypomagnesemia.

Thiazides may decrease urinary calcium excretion. Calcium may cause intermittent and slight elevation of serum calcium in the absence of known disorders of calcium metabolism. Marked hypercalcemia may be evidence of hidden hyperparathyroidism. Thiazides should be discontinued before carrying out tests for parathyroid function.

Increases in cholesterol and triglyceride levels may be associated with thiazide diuretic therapy.

**Information for Patients:** Angioedema, including laryngeal edema, may occur especially following the first dose of enalapril. Patients should be so advised and told to report immediately any signs or symptoms suggesting angioedema (swelling of face, extremities, eyes, lips, tongue, difficulty in swallowing or breathing) and to take no more drug until they have consulted with the prescribing physician.

**Hypotension:** Patients should be cautioned to report lightheadedness especially during the first few days of therapy. If actual syncope occurs, the patients should be told to discontinue the drug until they have consulted with the prescribing physician.

All patients should be cautioned that excessive perspiration and dehydration may lead to an excessive fall in blood pressure because of reduction in fluid volume. Other causes of volume depletion such as vomiting or diarrhea may also lead to a fall in blood pressure; patients should be advised to consult with the physician.

**Hyperkalemia:** Patients should be told not to use salt substitutes containing potassium without consulting their physician.

**Neutropenia:** Patients should be told to report promptly any indication of infection (e.g., sore throat, fever) which may be a sign of neutropenia.

**Pregnancy:** Female patients of childbearing age should be told about the consequences of second- and third-trimester exposure to ACE inhibitors, and they should also be told that these consequences do not appear to have resulted from intrauterine ACE-inhibitor exposure that has been limited to the first trimester. These patients should be asked to report pregnancies to their physicians as soon as possible.

**NOTE:** As with many other drugs, certain advice to patients being treated with VASERETIC is warranted. This information is intended to aid in the safe and effective use of this medication. It is not a disclosure of all possible adverse or intended effects.

**Drug Interactions, Enalapril Maleate, Hypotension—Patients on Diuretic Therapy:** Patients on diuretics and especially those in whom diuretic therapy was recently instituted, may occasionally experience an excessive reduction of blood pressure after initiation of therapy with enalapril. The possibility of hypotensive effects with enalapril can be minimized by either discontinuing the diuretic or increasing the salt intake prior to initiation of treatment with enalapril. If it is necessary to continue the diuretic, provide medical supervision for at least two hours and until blood pressure has stabilized for at least an additional hour. (See WARNINGS.)

**Agents Causing Renin Release:** The antihypertensive effect of enalapril is augmented by antiretensive agents that cause renin release (e.g., diuretics).

**Other Cardiovascular Agents:** Enalapril has been used concomitantly with beta adrenergic blocking agents, methylglucosides, calcium-channel blocking agents, hydralazine and prazosin without evidence of clinically significant adverse interactions.

**Agents Increasing Serum Potassium:** Enalapril attenuates diuretic-induced potassium loss. Potassium-sparing diuretics (e.g., spironolactone, triamterene or amiloride), potassium supplements, or potassium-containing salt substitutes may lead to significant increases in serum potassium. Therefore, if concomitant use of these agents is indicated because of demonstrated hypokalemia they should be used with caution and with frequent monitoring of serum potassium.

**Lithium:** Lithium toxicity has been reported in patients receiving lithium concomitantly with drugs which cause elimination of sodium, including ACE inhibitors. A few cases of lithium toxicity have been reported in patients receiving concomitant enalapril and lithium and were reversible upon discontinuation of both drugs. It is recommended that serum lithium levels be monitored frequently if enalapril is administered concomitantly with lithium. **Hydrochlorothiazide:** When administered concurrently the following drugs may interact with thiazide diuretics:

**Alcohol, barbiturates, or narcotics:**—potentiation of orthostatic hypotension may occur.

**Antidiabetic drugs (oral agents and insulin):**—dosage adjustment of the antidiabetic drug may be required.

**Other antihypertensive drugs:**—additive effect or potentiation.

**Cholestyramine and colestipol resins:**—Absorption of hydrochlorothiazide is impaired in the presence of anionic exchange resins. Single doses of either cholestyramine or colestipol resins bind the hydrochlorothiazide and reduce its absorption from the gastrointestinal tract by up to 85 and 43 percent, respectively.

**Corticosteroids, ACTH:**—intensified electrolyte depletion, particularly hypokalemia.

**Pressor amines (e.g., norepinephrine):**—possible decreased response to pressor amines but not sufficient to preclude their use.

**Skeletal muscle relaxants: neuromuscular blocking agents (e.g., tubocurarine):**—possible increased responsiveness to the muscle relaxant.

**Lithium:**—should not generally be given with diuretics. Diuretic agents reduce the renal clearance of lithium and add a high risk of lithium toxicity. Refer to the package insert for lithium preparations before use of such preparations with VASERETIC.

**Non-steroidal Anti-inflammatory Drugs:**—In some patients, the administration of a non-steroidal anti-inflammatory agent can reduce the diuretic, natriuretic, and antihypertensive effects of loop, potassium-sparing and thiazide diuretics. Therefore, when VASERETIC and non-steroidal anti-inflammatory agents are used concomitantly, the patient should be observed closely to determine if the desired effect of the diuretic is obtained.

**Carbamazepine, Mutagenesis, Impairment of Fertility:** Enalapril in combination with hydrochlorothiazide was not mutagenic in the Ames microbial mutagen test with or without metabolic activation. Enalapril-hydrochlorothiazide did not produce DNA single strand breaks in an *in vitro* alkaline elution assay in rat hepatocytes or chromosomal aberrations in an *in vivo* mouse

\* Registered trademark of Hospital Ltd.



## Health Care Reform - SoDaPAC

I have been involved in medical politics for approximately nine years and have witnessed a tremendous amount of change in that period of time. The change that I have seen and you have had to live with is nothing compared to what is in the wind for the not too distant future.

The scary part is that people are convinced that reform is necessary but no one can pinpoint exactly what "reform" really is. Rather than starting with the attitude that we have the best health care system in the world--let's fine tune it, the government and the media are planting thoughts of a total revamping of the health care delivery system.

Nobody knows for sure what this means but I believe we need to assume that the medical community will have less of the health care dollar to share than they have had in the past. I believe the trend is drastic and I believe the medical community must become proactive in presenting their positions to the public. That means getting involved to an extent that you probably never have before. I believe this wake-up call threatens your ability to even practice medicine in the manner and/or location of your choice. The principle of managed care dictates control of the number of specialists that may work for a designated/negotiated group which is just one example of what is in the future.

The question you have to ask yourself is "at what point in time are the economics of scale such that an investment in time and money is worth my while." I believe that the time is here and I believe I can justify, with examples, as to why and how you need to utilize your time and your money.

I am talking about SoDaPAC in reference to your dollar investment and I am talking about legislative key contact programs for your time investment.

I would be happy to visit with any of you regarding our political agenda individually or in a group. Don't hesitate to call.

Dean Krogman

Director of Governmental Affairs  
SD State Medical Association  
Sioux Falls, SD

bone marrow assay. **Enalapril Maleate:** There was no evidence of a tumorigenic effect when enalapril was administered for 106 weeks to rats at doses up to 90 mg/kg/day (150 times\* the maximum daily human dose). Enalapril has also been administered for 94 weeks to male and female mice at doses up to 90 and 180 mg/kg/day, respectively, (150 and 300 times\* the maximum daily dose for humans) and showed no evidence of carcinogenicity.

Neither enalapril maleate nor the active diacid was mutagenic in the Ames microbial mutagen test with or without metabolic activation. Enalapril was also negative in the following genotoxicity studies: rec-assay, reverse mutation assay with *E. coli*, sister chromatid exchange with cultured mammalian cells, and the micronucleus test with mice, as well as in an *in vivo* cytogenetic study using mouse bone marrow.

There were no adverse effects on reproductive performance in male and female rats treated with 10 to 90 mg/kg/day of enalapril.

**Hydrochlorothiazide:** Two-year feeding studies in mice and rats conducted under the auspices of the National Toxicology Program (NTP) uncovered no evidence of a carcinogenic potential of hydrochlorothiazide in female mice (at doses of up to approximately 600 mg/kg/day) or in male and female rats (at doses of up to approximately 100 mg/kg/day). The NTP, however, found equivocal evidence for hepatocarcinogenicity in male mice.

Hydrochlorothiazide was not genotoxic *in vitro* in the Ames mutagenicity assay of *Salmonella typhimurium* strains TA 98, TA 100, TA 1535, TA 1537, and TA 1538 and in the Chinese Hamster Ovary (CHO) test for chromosomal aberrations, or *in vivo* in assays using mouse germinal cell chromosomes, Chinese hamster bone marrow chromosomes, and the *Drosophila* sex-linked recessive lethal trait gene. Positive test results were obtained only in the *in vitro* CHO Sister Chromatid Exchange (clastogenicity) and in the Mouse Lymphoma Cell (mutagenicity) assays, using concentrations of hydrochlorothiazide from 43 to 1300 µg/mL, and in the *Aspergillus nidulans* non-disjunction assay at an unspecified concentration.

Hydrochlorothiazide had no adverse effects on the fertility of mice and rats of either sex in studies wherein these species were exposed, via their diet, to doses of up to 100 and 4 mg/kg, respectively, prior to conception and throughout gestation.

**Pregnancy, Pregnancy Category:** C (first trimester) and D (second and third trimesters). See WARNINGS, Pregnancy, Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality.

**Nursing Mothers:** Enalapril and enalapril are detected in human milk in trace amounts. Thiazides do appear in human milk. Because of the potential for serious reactions in nursing infants from either drug, a decision should be made whether to discontinue nursing or to discontinue VASERETIC, taking into account the importance of the drug to the mother.

**Pediatric Use:** Safety and effectiveness in children have not been established.

**ADVERSE REACTIONS:** VASERETIC has been evaluated for safety in more than 1500 patients, including over 300 patients treated for one year or more. In clinical trials with VASERETIC, no adverse experiences peculiar to this combination drug have been observed. Adverse experiences that have occurred, have been limited to those that have been previously reported with enalapril or hydrochlorothiazide.

The most frequent clinical adverse experiences in controlled trials were: dizziness (8.6 percent), headache (5.5 percent), fatigue (3.9 percent) and cough (3.5 percent). Adverse experiences occurring in greater than two percent of patients treated with VASERETIC in controlled clinical trials were: muscle cramps (2.7 percent), nausea (2.5 percent), asthenia (2.4 percent), orthostatic effects (2.3 percent), impotence (2.2 percent), and diarrhea (2.1 percent).

Clinical adverse experiences occurring in 0.5 to 2.0 percent of patients in controlled trials included: **Body As A Whole:** Syncope, chest pain, abdominal pain; **Cardiovascular:** Orthostatic hypotension, palpitation, tachycardia; **Digestive:** Vomiting, dyspepsia, constipation, flatulence, dry mouth; **Nervous System/Psychiatric:** Insomnia, nervousness, paresthesia, somnolence, vertigo; **Skin:** Pruritus, rash; **Other:** Dyspnea, gout, back pain, arthralgia, diaphoresis, decreased libido, tinnitus, urinary tract infection.

**Angioedema:** Angioedema has been reported in patients receiving VASERETIC (0.6 percent). Angioedema associated with laryngeal edema may be fatal. If angioedema of the face, extremities, lips, tongue, glottis and/or larynx occurs, treatment with VASERETIC should be discontinued and appropriate therapy instituted immediately. (See WARNINGS.)

**Hypotension:** In clinical trials, adverse effects relating to hypotension occurred as follows: hypotension (0.9 percent), orthostatic hypotension (1.5 percent), other orthostatic effects (2.3 percent). In addition syncope occurred in 1.3 percent of patients. (See WARNINGS.)

**Cough:** See PRECAUTIONS, Cough.

**Clinical Laboratory Test Findings; Serum Electrolytes:** See PRECAUTIONS.

**Creatinine, Blood Urea Nitrogen:** In controlled clinical trials minor increases in blood urea nitrogen and serum creatinine, reversible upon discontinuation of therapy, were observed in about 0.6 percent of patients with essential hypertension treated with VASERETIC. More marked increases, have been reported in other enalapril experience. Increases are more likely to occur in patients with renal artery stenosis. (See PRECAUTIONS.)

**Serum Uric Acid, Glucose, Magnesium, and Calcium:** See PRECAUTIONS.

**Hemoglobin and Hematocrit:** Small decreases in hemoglobin and hematocrit (mean decreases of approximately 0.3 g percent and 1.0 vol percent, respectively) occur frequently in hypertensive patients treated with VASERETIC but are rarely of clinical importance unless another cause of anemia coexists. In clinical trials, less than 0.1 percent of patients discontinued therapy due to anemia.

**Liver Function Tests:** Rarely, elevations of liver enzymes and/or serum bilirubin have occurred. Other adverse reactions that have been reported with the individual components are listed below and, within each category, are in order of decreasing severity.

**Enalapril Maleate:**—Enalapril has been evaluated for safety in more than 10,000 patients. In clinical trials adverse reactions which occurred with enalapril were also seen with VASERETIC. However, since enalapril has been marketed, the following adverse reactions have been reported: **Body As A Whole:** Anaphylactoid reactions (see PRECAUTIONS, Hemodialysis Patients); **Cardiovascular:** Cardiac arrest, myocardial infarction or cerebrovascular accident, possibly secondary to excessive hypotension in high risk patients (see WARNINGS, Hypotension); pulmonary embolism and infarction; pulmonary edema, rhythm disturbances including atrial tachycardia and bradycardia, atrial fibrillation; hypotension; angina pectoris; **Digestive:** Ileus, pancreatitis, hepatic failure, hepatitis (hepatocellular [proven on rechallenge] or cholestatic jaundice), melena, anorexia, glossitis, stomatitis, dry mouth; **Hematologic:** Rare cases of neutropenia, thrombocytopenia and bone marrow depression, a few cases of hemolysis in patients with G-6-PD deficiency have been reported in which a causal relationship to enalapril cannot be excluded; **Nervous System/Psychiatric:** Depression, confusion, ataxia, peripheral neuropathy (e.g., paresthesia, dysesthesia); **Urogenital:** Renal failure, oliguria, renal dysfunction (see PRECAUTIONS), flank pain, gynecomastia; **Respiratory:** Pulmonary infiltrates, bronchospasm, pneumonia, bronchitis, rhinorrhea, sore throat and hoarseness, asthma, upper respiratory infection; **Skin:** Exfoliative dermatitis, toxic epidermal necrolysis, Stevens-Johnson syndrome, herpes zoster, erythema multiforme, urticaria, alopecia, flushing, photosensitivity; **Special Senses:** Blurred vision, taste alteration, anosmia, conjunctivitis, dry eyes, tearing.

**Miscellaneous:** A symptom complex has been reported which may include a positive ANA, an elevated erythrocyte sedimentation rate, arthralgia/arthritis, myalgia, fever, serositis, leukocytosis, eosinophilia, photosensitivity, rash and other dermatologic manifestations.

**Fetal/Neonatal Morbidity and Mortality:** See WARNINGS, Pregnancy, Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality.

**Hydrochlorothiazide:**—**Body as a Whole:** Weakness; **Digestive:** Pancreatitis, jaundice (intrahepatic cholestatic jaundice), sialadenitis, cramping, gastric irritation, anorexia, **Hematologic:** Aplastic anemia, agranulocytosis, leukopenia, hemolytic anemia, thrombocytopenia; **Hypersensitivity:** Purpura, photosensitivity, urticaria, necrotizing angitis (vasculitis and cutaneous vasculitis), fever, respiratory distress including pneumonitis and pulmonary edema, anaphylactic reactions; **Musculoskeletal:** Muscle spasm; **Nervous System/Psychiatric:** Restlessness; **Renal:** Renal failure, renal dysfunction, interstitial nephritis (see WARNINGS); **Skin:** Erythema multiforme including Stevens-Johnson syndrome, exfoliative dermatitis including toxic epidermal necrolysis, alopecia; **Special Senses:** Transient blurred vision, xanthopsia.

\* Based on patient weight of 50 kg.

For more detailed information, consult your DuPont Pharma Representative or see Prescribing Information.

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**MERCK & CO., INC.**  
West Point, PA 19486, USA

Printed in USA

Issued October 1992  
7432317



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problems that may contribute to malpractice claims and structure programs to address malpractice risks.

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MMIC was founded, and is owned by physicians. Looking at issues from your perspective has helped us build assets in excess of \$140 million, serving the finest physicians and clinics in the midwest. To learn more about MMIC, call (612) 922-5445. Or if you're located outstate, (800) 328-5532.



## From School Without Walls to Library Without Walls – Continued Medical Progress on the Wide Open Plains!

When the concept that there would be a medical school without walls operating in several areas of the state and without the traditional university hospital was promoted, many were skeptical that a quality medical education could be delivered in this format. The graduates of the four year school in South Dakota, over 40% of whom return to practice in the state, are their own proof of the success of the venture. Now, a pamphlet entitled "A Prospectus for the South Dakota Health Sciences Library" proposes a library without walls and a library without clocks to boot. The prospectus says "there is no more important single step South Dakota can now take to improve health care here than to build and equip this library" which will be housed in Sioux Falls where two major medical centers already have sizeable libraries. Why do we need this structure whose total costs will be 4.2 million dollars?

No one of us practicing medicine has been untouched by the knowledge explosion. Even fairly narrow specialists cannot keep up with publications in their sphere of interest. What is more pertinent, knowledge is changing at an alarming rate. The hospital library will continue to be necessary but can it possibly meet the demands of massive increases in journals and periodicals and rapidly changing information? Both space and financial limitations indicate a negative response. Even for large institutions this presents a problem. Certainly for the rural physician the whole situation appears unsolvable.

However, the new concept of the Health Sciences Library creates the faster, more flexible and more complete links between those who deliver health care and the major sources of health care information in the world. The use of computer links by PC or modem can provide such links and can accomplish this in any rural area of the state (without walls) and can do it anytime of day or on weekends (without clocks).

This sounds good but is this only for those who are well versed in the ways of computers? This is where the librarians are important in teaching health care providers ways to rapidly access updated data bases not before available. This is the age of computers and age of information. If we cannot provide this kind of service to physicians in all areas of the state as a bridge to the future, it is hard to believe quality health care can be delivered where it is best for the patient.

Here are some tangential benefits of this new library concept.

1. The rural physician or physician in any office anywhere can gain immediate access to needed information when it is most needed.

2. Recruiting for health providers in the state will be enhanced because the system is available.
3. Business and lay people can access needed information for such projects as wellness programs.
4. It will greatly aid medical education for medical students who upon graduation will be fluent in this system necessary for their practices.
5. In a time of increasing financial constraints, purchase and storage of accumulating and often soon outdated material will be less of a problem.

The library of the future will be as different tomorrow as the health care center today is different from that one that even recent graduates remember just a short time ago. This new library is, indeed, a bridge to the future.

\* \* \*

Periodically the Journal receives articles which have a combination of scientific data and author opinion/perspective. Such articles will be placed in a new section of the Journal called "Viewpoint".

John F. Barlow, MD  
Editor

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# South Dakota Foundation for Medical Care

## WE WOULD LIKE YOUR HELP!

The South Dakota Foundation for Medical Care (SDFMC) is required by HCFA to develop "local improvement projects" in response to local quality of care concerns for Medicare patients in South Dakota hospitals. The planning and execution of these improvement projects requires input from physicians and hospitals about specific quality of care concerns existing at local hospitals in South Dakota. These concerns could come from individual medical staff members or from hospital medical staff committees such as your utilization review committee or quality improvement committee.

Selection of projects will be based on the following criteria: the condition of interest should be a common condition; it should rest on firm scientific ground with regard to diagnosis and therapy; there should be a consensus on practice guidelines; variations in care and outcome must be known to exist; and there should be reason to believe that change in these variations in care and/or outcome is feasible. The process of care of patients with acute myocardial infarction is an example of a possible local improvement project.

We need your suggestions about local improvement projects that could help you improve the quality of care in your hospital. Please share with us the quality of care concerns identified in your hospital. This will help make any local projects more relevant to your medical practice and perhaps identify ways in which you or your hospital quality improvement committee could initiate change that will result in improvements in the process of care or the outcome of care in your hospital.

The Health Care Financing Administration (HCFA) in Washington has asked us to focus on problems that occur frequently in your hospital, (i.e., the most frequent DRG's). HCFA suggests that we begin this process by keeping the projects quite small and not too complex. All projects will be short-term and last no longer than 9 months.

Next month we will give you some information on our capabilities to provide statistical analysis of Medicare claims data to provide information that may help you improve the quality of patient care in your hospital. Please call or write me with any suggestions.

Bruce Lushbough, MD, MS  
Principal Clinical Coordinator  
South Dakota Foundation for Medical Care  
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Phone: (605) 336-3505

# Postintubation Tracheal Stenosis: Diagnosis and Management

*George J. Kontos Jr, MD; Craig P. Hedges, MD; Michael C. Rost, MD; David K. Nussbaum, MD; and Jeffrey W. Hanson, MD*

## ABSTRACT

Postintubation damage is a potential hazard in any patient intubated with an oral or nasal endotracheal tube or with a tracheostomy tube for ventilatory support. Postintubation tracheal stenosis may be fatal unless it is recognized and treated promptly. This paper reviews the important features of diagnosis and treatment of postintubation tracheal stenosis.

## INTRODUCTION

Strictures of the trachea may result from a number of different general causes. Congenital stenoses are rare. Post-traumatic strictures, particularly where there has been tracheal separation, occur. The most common type of stricture still results from intubation, usually for ventilatory support. Tracheal lesions often are recognized late, despite a prolonged period of symptoms. However, if a patient remains sedentary while recovering from his original disease, the airway may shrink to a critical diameter before symptoms become obvious. Fatal obstruction may occur at any time. The following case report illustrates many of the clinical problems associated with postintubation tracheal stenosis.

## REPORT OF CASE

A 38 year old female with a previous history of insulin dependent diabetes mellitus developed diabetic coma complicated by a cardiopulmonary arrest on September 12, 1992. She was successfully resuscitated but had anoxic encephalopathy, renal failure requiring temporary dialysis and prolonged ventilator dependence requiring tracheostomy on October 1, 1992. Her mental status improved and her renal function recovered. She was weaned from the ventilator and her tracheostomy removed on October 21, 1992.

Two months after her arrest, she was transferred to an in-hospital physical medicine and rehabilitation program. While convalescing on

the rehabilitation ward, she developed progressive upper airway stridor, cough and dyspnea on exertion. Pertinent physical findings included inspiratory and expiratory stridor over the cervical trachea and clear lung fields. Results of initial laboratory tests were normal.

The chest roentgenogram showed narrowing of the intrathoracic trachea. (Figure 1) Tomograms of the

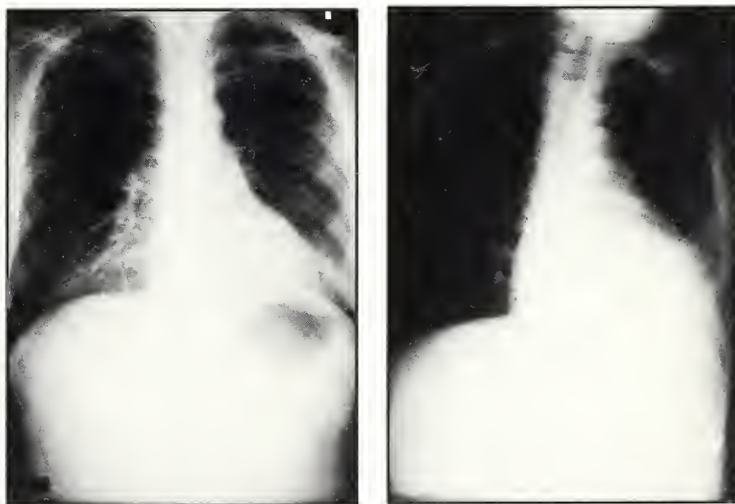


Figure 1

Chest roentgenograms. 1A--at time of admission to rehabilitation unit. There was narrowing of the intrathoracic mid trachea. This was consistent with postintubation tracheal stenosis. 1B--at time of hospital dismissal. After tracheal resection and reconstruction through a combined cervical and partial sternotomy approach, there was a normal caliber airway.



trachea demonstrated severe stenosis of the intrathoracic trachea. (Figure 2)

The patient underwent diagnostic and therapeutic rigid and flexible bronchoscopy. Bronchoscopic examination demonstrated a tracheal stenosis arising 10.5 cm distal to the true vocal cords, consisting of circumferential fibrous tissue surrounding an opening of 4 mm. The tracheal stricture extended for a length of 3 cm. The distal end of the stenosis was 4.5 cm above the carina. The tracheal stricture was initially



Figure 2

Preoperative tracheal tomogram. There was a long intrathoracic mid tracheal stricture.

dilated with a series of modified Jackson dilators. Then, the yttrium-aluminum-garnet laser was employed. The number 8 rigid bronchoscope was subsequently passed through the tracheal stenosis. Flexible fiberoptic bronchoscopy of the distal tracheobronchial tree showed marked edema of the tracheal and bronchial mucosa and a large amount of inspissated secretions. Following removal of the rigid bronchoscope, the patient was intubated with a 7 mm internal diameter endotracheal tube. After the patient awakened from anesthesia, she was extubated.

Over the next three days, she was treated with aggressive bronchopulmonary toilet and nebulizers. She then underwent tracheal resection and reconstruction through a combined cervical and partial sternotomy approach. The previous cervical incision was opened and the trachea exposed. There was dense scar about the previous tracheostomy stoma. The anterior portion of the cervical trachea was exposed from the cricoid cartilage to the thoracic inlet. The anterior portion of the intrathoracic trachea was mobilized with blunt dissection. The tracheal stenosis was located at the level of the manubrium. Therefore, partial sternotomy was performed to gain satisfactory exposure. That portion of the trachea containing the stricture was circumferentially mobilized while keeping the dissection very close to the trachea. The trachea was divided just distal to the stricture. An anode tube was inserted into the distal open trachea, the cuff inflated and ventilation resumed. The trachea was then divided just proximal to the stenosis, thereby removing a 3.5 cm segment of diseased trachea. (Figure 3) The proximal and distal portions of the trachea were mobilized posteriorly, while avoiding any dissection in the lateral areas. After flexion of the head, the proximal and distal portions of the trachea were approximated. The primary tracheal anastomosis

was performed using interrupted 4-0 Vicryl suture. After placement of the posterior row of sutures, the anode tube was removed and the previously placed endotracheal tube guided beyond the anastomosis. Ventilation was resumed and the anterior row of interrupted sutures placed. After completion of the tracheal anastomosis, the endotracheal tube was positioned proximal to the anastomosis. The patient was awakened in the operating room and extubated. At the time of extubation, the cords were noted to move bilaterally as assessed through the fiberoptic bronchoscope. The patient had a satisfactory postoperative convalescence and was dismissed from the hospital one week after operation.

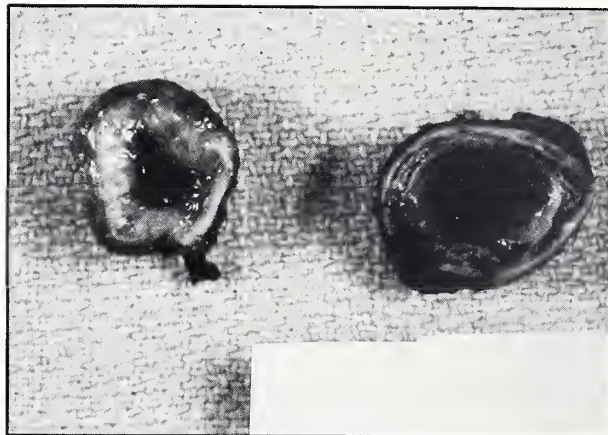


Figure 3

Portion of resected trachea. There was circumferential stenosis at the tracheostomy cuff level.

## DISCUSSION

Intubation, either with oral or nasal endotracheal tubes or with tracheostomy tubes, has been used increasingly to deliver mechanical ventilatory support for respiratory failure. The two principle types of stricture that follow intubation are (1) strictures at the level of the tracheostomy stomas and, (2) those at the level of the endotracheal tube/tracheostomy cuff,<sup>1</sup> as occurred in our patient. The etiology of cuff stenosis has been variously attributed to pressure necrosis by the cuff, irritative materials in rubber and plastic cuffs and tubes, irritant materials produced by gas sterilization, hypotension and bacterial infection. Most data supports pressure necrosis as the principle etiologic agent.<sup>2-5</sup> The mucosa overlying the cartilages is initially destroyed. The bared cartilages become necrotic and ultimately sluff. The injury consists of massive cicatricial stenosis of scar tissue within the tracheal lumen.<sup>6,7</sup>

Patients develop symptoms and signs of airway obstruction, consisting of dyspnea on exertion, stridor, cough and obstructive episodes. Hemoptysis does not occur. Any patient, who develops symptoms of airway obstruction, who has been intubated for 48 hours or more within the previous two years, must be considered to have organic obstruction until proved otherwise.

Most patients demonstrate symptoms between 10 and 42 days after extubation.

Appropriate roentgenographic examinations are used increasingly to rule out the possibility of a tracheal lesion in any patient who has obstructive airway symptoms with roentgenographic demonstration of normal lung fields. Rarely, specialized techniques will fail to reveal an unusual lesion and bronchoscopic examination will be required. Roentgenographic studies of the trachea include lateral, anteroposterior and oblique views of the airways. The anteroposterior and lateral chest x-rays demonstrated the intrathoracic tracheal stenosis in the patient described in our report. Tracheal tomograms help if precise measurement of the extent of the lesions and their relative distances from landmarks, such as the vocal cords and the carina, are required. Bronchoscopy is best deferred until preparations have been made for definitive treatment of the lesion. Rigid bronchoscopy under general anesthesia is used to dilate severe stenoses for emergency relief. Urgent operation is almost never required. Dilation or endotracheal removal of inflammatory strictures, whether mechanically or by laser, is only a temporary measure.

The use of these techniques in emergent situations allows more thorough evaluation of the patient and allows surgery to be performed electively as illustrated in our patient.

The preferred treatment of benign obstruction of the trachea is resection and reconstruction when the patient can tolerate it. With careful evaluation, planning and execution, most patients with lesions, such as tracheal stenosis, can be successfully treated operatively when they have recovered from the primary disease that led to the stenosis. Non-operative methods of temporizing are, however, available. Rarely, the medical condition may not permit even the relatively benign procedure required.

If the patient has serious neurologic or psychiatric deficits that will prevent cooperation in the postoperative phase, reconstruction is best deferred. If ventilatory support is needed postoperatively in a shortened trachea, the cuff will probably rest against the anastomosis and may lead to dehiscence.

The temporizing methods available are repetitive bronchoscopic dilatation of a stenosis or re-institution of a tracheostomy, and dilatation of the stricture and passage of a tracheostomy tube or a silicone T-tube through the lesion to splint the airway.

The incidence of stenosis at the stomal level can be reduced by careful placement of the stoma, avoidance of large apertures and elimination of heavy ventilatory connecting equipment and meticulous care of the tracheostomy. Measures to reduce the heretofore inevitable occurrence of some stenoses at the cuff level have been proposed. A promising method is the development of large-volume, low pressure cuffs that conform to the shape of the trachea rather than deforming it.<sup>8-9</sup>

In summary, postintubation tracheal stenosis is a potentially fatal complication. Mortality relates to delay in diagnosis. The clinician must be alert to the subtle and often protean manifestations of postintubation tracheal stenosis.

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# CONTRIBUTORS NEEDED!

During the last four years the South Dakota Medical School Endowment Association has granted more than 200 loans totaling over \$220,000. These low interest (6%) loans go to medical students who are attending the University of South Dakota School of Medicine. The needs of these medical students continue to increase. To meet these needs the Endowment must have continued growth in both the size and numbers of donations.

## WE NEED YOUR HELP!!!

Please make your checks payable to:

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**Patti Herlihy, President, South Dakota  
State Medical Association Alliance**

Every now and then I come across an article that totally captures my attention. Betty Huffacker, Missouri State Medical Association Alliance President, wrote such an article in the MSMAA July Newsletter. The facts presented regarding Hillary Rodham Clinton are quite revealing; the content was so appropriate for dealing with our current frustrations that I called Betty and asked her permission to reprint parts of this article. Hopefully you will also gain some additional insight into whom we are dealing with in shaping the future of the practice of medicine as we know it! Please read on...

I read an interesting article the other day in the St. Louis Post-Dispatch written by a Mr Stephen Chapman. It was entitled, "The First Lady is Afflicted with Moral Superiority." Naturally, anything dealing with Hillary Rodham Clinton causes me to pause a moment; thus, I gave the article a cursory glance...

In this article, Mr Chapman points out that Hillary Rodham Clinton made \$203,000 from her law practice last year in comparison to the average \$139,000 median income of a physician. Can you guess "who accuses whom of making indecent sums of money?"

He goes on to state that "there are two scandals in our system of medical care" according to Mrs Clinton. "Some people have no insurance, and some people make too much money."

He points out that the "uninsured are a problem but you won't learn much about them from Mrs Clinton. Those Americans who lack health insurance, on average, lack it for only about four months. Many elect to do without it, betting that they won't get sick

and knowing that if they do, free care can be had." All one has to do is look at the physicians' books to see how much free care is given. I know of no physician who turns away anyone in true need.

Furthermore, "about 60% of those without coverage are under 30, a healthy group; a quarter come from households earning more than \$30,000 a year. Very few are denied coverage and, of Americans who are not elderly, only 1% are uninsurable."

He goes on to quote Mrs Clinton as saying that the health system is riddled with "price gouging, cost shifting and unconscionable profiteering. Too many people have made too much money off of eliminating opportunities for caring for people instead of expanding those."

No one seems sure who the first lady is referring to with her statements, but Mr Chapman explored several possibilities. Could she be referring to physicians? The question arises, should a woman who only last year was making a six figure income which was much greater than the median income of doctors chastise them for greed?

Could she be referring to hospitals? It is a known fact that almost "90% of the hospital care in this country is provided by non-profit institutions which are allowed neither excessive profits nor any other kind..."

He feels that Mrs Clinton is being "most invincibly arrogant believing that the most advanced and capable system of medicine in the world, available to nearly all, is so thoroughly rotten that anything would be better." Mr Chapman feels, and I so heartily agree with him, that not much could be better, and there are many things that could be tragic. "Creating a system that delivers the world's best medical care is hard; wrecking it is easy."

I question the wisdom and sincerity of individuals who believe that it is okay for them to make over \$200,000 a year and yet criticize the medical community which has a median income far less than they and have spent on the average more years in training than they. I know of no physicians who avail themselves of \$245 haircuts. Is this not patronizing to the American public, telling us what is good for us, all the while living by a totally different set of rules? I guess I am just old-fashioned. I believed my mother and try to live by her admonishment, "you are as good as anybody, but better than no one." Maybe the President and Mrs Clinton should have a talk with my mother.

**Bravo, Betty!**

*Patti Herlihy*



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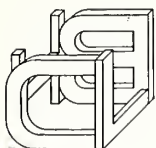
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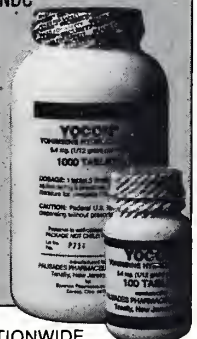
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1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
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# Carcinoma of the Extrahepatic Bile Duct

*Maher A. Rezkalla, MD, Jeffrey Luther, MD, Larry Schafer, MD*

## ABSTRACT

We present a case of a 70-year old American Indian who had a previous cholecystectomy for symptomatic cholelithiasis and who presented, one year later, with progressive painless jaundice and a dilated common bile duct. Work-up revealed an adenocarcinoma of the extrahepatic bile duct. In this article we discuss the common presentation, work-up, and treatment of carcinoma of the bile ducts.

## CASE REPORT

A 70-year old American Indian with insulin dependent diabetes mellitus who underwent a cholecystectomy for symptomatic cholelithiasis one year prior to presentation. He was admitted to the hospital for evaluation of progressive painless jaundice. The patient was initially presented with a chief complaint of abdominal pain and jaundice for two to three weeks prior to admission. He also complained of pale stools, dark brown urine and nausea but no vomiting. He denied fever, chills, chest pain or shortness of breath. The review of system was otherwise noncontributory. He had a CT scan of the abdomen done at an outside facility which showed normal liver, spleen, pancreas, metallic surgical clips in the region of the gallbladder bed, but without any evidence of bile duct dilatation, pancreatic enlargement or adenopathy. The patient was a smoker for 45 years, but quit about 20 years ago. He's denied any alcohol consumption for the past 5 years.

Physical exam on admission revealed: 70-year old male who was in no acute distress. Blood pressure, 140/70; temperature, 98; pulse, 80; respiration, 16. Eye exam was pertinent to very obvious yellow sclera. Lung exam revealed diminished breath sounds and mild rhonchi bilaterally. There was a well healed smooth scar over the right lateral, lower aspect of the chest from his previous lobectomy done for a history of TB in 1957. Cardiac exam was normal. Abdominal exam showed minimally distended abdomen. The liver was noted to be 12 cm by percussion at the midclavicular line. There was mild diffuse tenderness on deep palpation. Extremities revealed no edema with good peripheral pulses bilaterally and minimal nail clubbing. Rectal exam revealed a questionable 1 cm prostatic nodule. Stool was heme negative.

Laboratory studies on admission revealed the following values: white blood cell count, 8,900/cumm; hematocrit, 39%; hemoglobin, 13.6 g/dl; MCV, 88 cmm; platelets, 705,000/cumm; alkaline phosphatase, 427 units/L (38 to 136); SGOT, 68 units/L (5 to 35); LDH, 371 units/L (297 to 537); bilirubin, 16.9 mg/dl (.2 to 1.3); gamma GTP, 610 units/L (15 to 85); SGPT, 69 units/L (7. to 56); serum albumin, 3 g/dL; and serum calcium, 8.2 mg/dl (9.1 to 10.6). His serum levels of creatinine, BUN, glucose and electrolytes were normal. His urinalysis revealed 100 mg/dl protein, a large amount of bilirubin, 5 to 10 WBC/hpf, and 3+ bacteria. Urine gram stain was negative. Chest roentgenogram revealed hyper-expanded lungs, a small fibrotic change in the right apex and post operative change in the right lung. There were no acute changes.

## Hospital Course

The patient was admitted with a provisional diagnosis of obstructive jaundice of undetermined etiology. The plan was to rule out stricture, stenosis and carcinoma of the bile duct. He had a repeat CT of the abdomen and pelvis which was unremarkable except for mild dilatation of the right and left intrahepatic ducts, the common hepatic and the proximal common bile ducts. ERCP demonstrated a high grade stricture (adjacent to a surgical clip) with dilatation of the proximal bile duct and biliary ducts. (Figure 1) A large gastric polyp was also noted.

The patient was scheduled to undergo a laparotomy and resection of the gastric polyp. During the operation, he was found to have an extensive nodular area on the lateral side of the hepatic ligament extending to the duodenum and encasing the portal vein. A biopsy of the area was consistent with adenocarcinoma. There was a 3-4 cm area of soft common duct above the



sclerotic area and an anastomosis was done between the small bowel and the common bile duct. The gastric polyp was also resected and was benign. The final pathologic diagnosis was consistent with, moderately differentiated adenocarcinoma of the hepatoduodenal ligament. (Figure 2)

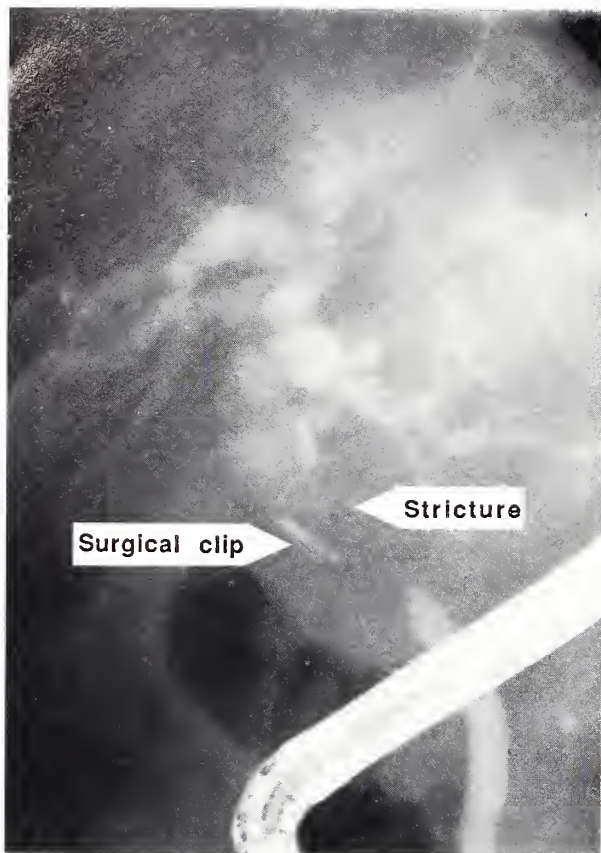


Figure 1

ERCP reveals high grade 2 cm stricture adjacent to a surgical clip. The entire biliary tract is dilated proximal to the stricture.

The patient has done well postoperatively with the bilirubin decreasing to almost normal values. The patient was referred to his hometown physician for radiation and chemotherapy.

## DISCUSSION

### Epidemiology

The autopsy incidence of carcinoma of the bile duct ranges between 0.05% and 0.46%. It is usually encountered in about 1% of all patients undergoing biliary tract surgery. Gallstones are present in about 30% of reported cases in contrast to carcinoma of the gallbladder itself, in which gallstones are present in about 74-92% of cases. The exact etiology of carcinoma of the bile duct is still unknown, however prolonged cholestasis and infection may play a carcinogenic role. Among the predisposing factors are chronic inflammation caused by sclerosing cholangitis, chronic suppurative cholangitis, biliary parasites and typhoid organisms. The incidence of carcinoma of the bile duct

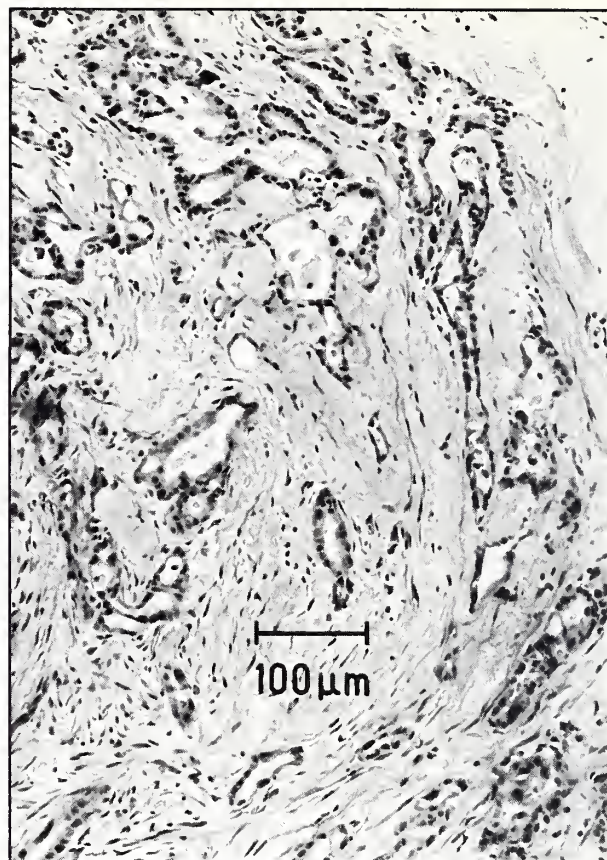


Figure 2

Poorly differentiated adenocarcinoma with irregular atypical glands trapped in a fibrous connective tissue stroma. Hematoxylin and eosin stain. Bar equals 100 micron.

is also increased in patients with ulcerative colitis, however proctocolectomy does not seem to be protective. All choledochal cysts are associated with an increased incidence of carcinoma of the bile duct. Solitary adenomas and biliary papillomatosis are also considered pre-malignant. The age of presentation ranges from the 2nd to 8th decade with the 6th decade being the most common age of presentation.

### Pathology

Carcinoma of the bile duct, also known as cholangiocarcinoma, is almost always pure adenocarcinoma, although anaplastic or squamous varieties can occur in 1%-2% of cases. Microscopically the most common type has a sclerosing histology (about 70% of cases) followed by papillary and nodular histology (10-20% of cases).

The location of the tumor is of major importance in determining the clinical presentation and management. Most investigators define three regions that can be affected by bile duct carcinoma.

1. Proximal - This includes major segmental intrahepatic ducts, right and left hepatic duct and the proximal common hepatic duct. This is the most common location and occurs in about 50% of cases.

2. Middle - This includes distal hepatic duct, cystic duct and the proximal common duct. This is found in about 25% of cases.
3. Distal - This includes the distal common duct in about 20% of cases and can be multifocal in less than 5% of patients.

Direct invasion of the surrounding structures, mainly liver, portal vein, and the pancreas is the most common pattern of spread and occurs in about 70% of patients. Extension to the lymph nodes in the portahepatis, celiac axis and pancreaticoduodenal nodes are present in about 40% of cases. Peritoneal or distant metastasis are noted in less than 10% of patients at presentation.

### Clinical Presentation

Painless obstructive jaundice with serum bilirubin over 13 mg/dl is usually present in over 50% of cases. Vague abdominal symptoms, an increase in serum alkaline phosphatase or gamma GTP and the absence of jaundice can occur in rare patients with obstruction of only one hepatic duct. Weight loss (50%), cholangitis (30%), pruritis, anemia and steatorrhea are other presentations. The most common physical findings are jaundice, hepatomegaly and a palpable gallbladder. Terminally, biliary cirrhosis, portal hypertension and ascites may develop over a period of 6 months.

### Diagnosis

Laboratory tests are usually non-specific, but are useful in confirming the obstructive nature of jaundice. Findings include an increase in serum bilirubin, alkaline phosphatase, gamma GTP, and a decrease in serum albumin.

Ultrasound is very helpful and is highly sensitive in detecting bile duct obstruction. The ultrasonographic feature suggesting bile duct carcinoma include:

1. Proximal duct dilatation.
2. Focal narrowing or thickening of the duct.
3. Persistent intraluminal soft tissue echoes or echogenic transluminal bands.

Cholangiography is a prerequisite and complete visualization of the intrahepatic and extrahepatic bile duct is essential. Percutaneous transhepatic cholangiography is preferred over endoscopic cholangiography because the intrahepatic ductal extension of the tumor and the intrahepatic ductal anatomy available for bilioenteric bypass is better defined. The next step in diagnosis is a fine needle aspiration after localization of the tumor. Fine needle aspiration is positive in approximately 87% of cases.

Carcinoma of the proximal bile duct is unresectable in about 50 %-70% of cases. The criteria of unresectability of proximal carcinoma of the bile duct include:

1. Bilateral intrahepatic spread beyond second order ducts.

2. Involvement of the main trunk of the portal vein.
3. Bilateral involvement of the hepatic arterial or portal venous structures.
4. Vascular involvement of one side of the liver with contralateral extensive ductal involvement.

### Treatment

Preoperative decompression is not advocated routinely since three prospective trials of preoperative percutaneous transhepatic biliary drainage have not shown any decrease in the operative mortality, but have shown significant morbidity related to drainage and increased cost of hospitalization.

### Surgical Approach

Surgery can be either curative or palliative. Cholangiocarcinoma of the distal bile duct may be cured by means of a Whipple operation or radical pancreaticoduodenectomy. The five year survival rates after this operation range from 16%-68% with a mean survival rate of 42%.

Carcinoma of the mid duct can be treated by en-bloc cholecystectomy, resection of the common hepatic and supraduodenal common bile duct, resection of the cystic and choledochal lymph nodes, and roux-en-y hepatojejunostomy. The five year survival rate after such an operation is unknown because the low prevalence of tumors in this location.

The surgical treatment of carcinoma of the proximal duct varies, but primarily includes the same procedures used for mid duct tumors and extends the resection proximally to include the bile duct. Again, carcinoma of the proximal bile duct has been shown to be unresectable in about 50%-70% of cases. Other treatment options are decompression, palliative bilioenteric bypass of enterohepatic cholangiojejunostomy to segment three duct. The mean survival for carcinoma of the proximal duct varies from 9-30 months. The results of the liver transplantation has been poor.

### Radiotherapy

This is mainly palliative and is usually in the form of external beam irradiation. In a series of 18 patients with gallbladder or extrahepatic bile duct cancer, the median survival was 11 months as opposed to 5 months in patient without radiation therapy. To overcome the morbidity of radiating the adjacent organs and to increase tumorcidal doses, boost techniques have been employed, however survival has not been significantly prolonged. The role of adjuvant radiation following curative resection is unknown.

### Chemotherapy

This has not been studied extensively because of the low incidence of the disease. There is no current standard regimen, however partial regression has been noted with 5FU.

Patients treated with Mitomycin C and Adriamycin have 30% response rate, few complications and a



median survival of 8 to 18 months. The role of adjuvant chemotherapy is still under investigation.

#### ACKNOWLEDGEMENT

Special thanks to Dr. Jerry L. Simmons for his help in providing the pathology slide and to Kristi Staton for secretarial support.

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| <b>Craig E. Crismon, MD</b><br>Brown Clinic<br>506 First Ave, SE<br>Watertown, SD 57201                                  | <b>PD</b>       | <b>Jessica R. Oesterheld, MD</b><br>USD School of Medicine, Dept of Psy<br>2501 W 22nd St<br>Sioux Falls, SD 57105 | <b>CHP</b> |
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### Physicians and Health Care Reform – A Perspective

Tom Dean, MD, family practice, Wessington Springs, SD

This is a difficult time in medicine. Our capacity for life-saving interventions has never been greater and yet we hear continually that our health care system is failing. Our scientific understanding of disease processes is more sophisticated than ever and yet we still have children dying of measles and gastroenteritis.

This conflict calls to mind the famous opening lines of Dickens' *Tale of Two Cities*. "It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of light, it was the season of darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us..."

Our society is moving rapidly into an era of health care reform. The momentum is real. The direction and final destination are less than crystal clear. As we approach this unsettling time it is vital that we as physicians maintain our perspective. We must not allow the rhetoric, which will inevitably be exaggerated and emotional, to put us on the defensive or to distract us from the fundamental goals of our profession. We must maintain our focus on the real contributions we can make to the creation of an improved system.

The first consideration is that reform is necessary. Our current system, though it served us well in many ways through the first three quarters of this century, has fundamental defects. These have become increasingly apparent as the advance of biotechnology has moved our capability for effective intervention beyond our ability to pay for those interventions. Our rapid development and application of diagnostic and therapeutic interventions has left us with many procedures that have been incompletely evaluated and whose role and value we do not completely understand. Our resources are clearly limited and we must find a way to use them more efficiently and effectively.

Equity in treatment for the whole population has never been a central element of our system but the current inequities of access and outcome are more glaring and unacceptable than ever before. We are failing to deliver even such basic services as immunizations to substantial portions of our population. The evolution of a specialty dominated system has frequently led to fragmented care with no one truly looking after the interests of the whole individual. Following aggressive multi-specialty workups I have all too often heard from patients that they felt used rather than cared for.

That perception may well be incorrect but it is the impression they come away with.

We have developed a reimbursement system which often places physicians in a position of direct conflict of interest. They are expected to make decisions about whether to utilize procedures from which they will receive substantial financial benefit. All this takes place in a society which has a low tolerance for less than perfect outcomes and a liability system which has placed the medical profession increasingly on the defensive. The fear of malpractice has made doctors less willing and less able to take risks which might well be in the best interest of their patients.

**WE NEED REFORM.** The prospect, however, is disturbing because change is disturbing. There is a very real risk that we could make things worse. In spite of that danger the risk is one we must take. The problems for both patients and physicians are too deep and too far reaching not to seek change.

The fact that change presents risk is the reason we as a profession must maintain our involvement with the process and do our best to provide wise counsel as to what kinds of structures will facilitate good care. However; if we are to have credibility it is essential that we make a clear distinction between what we do to protect our own self interest and what we propose to improve the situation for our patients. All too often in the past, organized medicine and many individual physicians have failed to make that distinction. Their proposals have been transparently self serving. They have been recognized as such and as a result our influence in these debates has diminished substantially.

There is no doubt that physicians are part (but only part) of the problem. There are those among us who have used the current system for great financial gain—far beyond any reasonable measure of what they have contributed. They have used the freedom of the last decade to peddle their wares (their gadgets and new procedures) in a manner not unlike the snake oil salesmen of a bygone era. To the extent this has happened it has diminished the professionalism of us all. Such behavior has placed our patients in the uncomfortable position of having to assume a "let the buyer beware" attitude which in turn puts all of us on the defensive to some degree.

While the media would have us believe that avarice and greed dominate medical decision making, I am convinced (with a few notable exceptions) that this is not the case. I believe most physicians want to do what is best for their patients. They wish to be viewed as responsible compassionate individuals who have an honest and a significant contribution to make to the welfare of their patients and to the betterment of their communities. Many of us who desire to be regarded in that way feel victimized by a system which seems in-

creasingly to believe we cannot be trusted to exercise responsible judgment. Instead of being respected for our efforts we are regulated and micromanaged until the concept of professional judgment ceases to have any real meaning.

It is precisely this situation which leads me to the conclusion that we must support reform and attempt to guide it in a direction which will respond to the very real needs of our patients. If we can do so effectively, I submit that it will go a long way toward restoring the profession of medicine to the position of respect it once enjoyed. The respect we desire derives not from our education and our degrees but from our contributions. It is not automatic. It must be earned.

We must approach the task with humility and with a clear understanding of the difference between our own selfish interest and the public interest. The time is long gone when we could direct public policy simply by stating that because of our experience we know best. At the same time, I believe there is a great deal of overlap between what is in the public interest and what is in the long term best interest of medicine. Any system which truly serves the public's needs will certainly enhance the status of those who provide the services. Conversely, a system (such as our current one) which fails to meet those needs will certainly detract from the status of those who operate it.

If we are to move beyond our current mess, there will be sacrifices to be made — especially by those who have benefitted so abundantly from the existing structure. Some of these may be painful but I am firmly convinced that failing to make them will result in even more pain.

Medicine is a grand and noble profession. Some of the lustre has been tarnished by the commercialism of the past decade. We have allowed ourselves in some situations to become detached technicians rather than true caring professionals. The grandeur, however, is not lost. I have no doubt that it can be restored if we acknowledge our problems and reassert the traits of service, compassion, integrity and humility which have guided the profession so effectively through the centuries.

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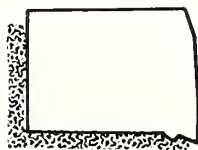
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# SOUTH DAKOTA JOURNAL OF MEDICINE

Volume 46/No. 10 October 1993

(ISSN 0038-3317)

Official Publication of the  
South Dakota State Medical Association  
the South Dakota Chapter of the  
American College of Surgeons  
the South Dakota Psychiatric Association  
of the American Psychiatric Association

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SOUTH DAKOTA JOURNAL OF MEDICINE (ISSN 0038-3317) is published monthly by the South Dakota State Medical Association, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Subscription price: \$15 per year domestic, \$18 per year foreign, \$1.75 for single copy. Second class postage paid at Sioux Falls, South Dakota 57101 and additional mailing offices. POSTMASTER: Send address changes to SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105.

NATIONAL ADVERTISING: Contact State Medical Journal Advertising Bureau, Inc, 711 South Boulevard, Oak Park, Illinois 60302. Phone: 708-383-8800.

LOCAL AND CLASSIFIED ADS: Contact Jeri Spars, SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Phone: 605-336-1965.

PRINTER: The Ovid Bell Press, Inc, PO Box 370, Fulton, Missouri 65251-0370.

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## NEXT MONTH

An Analysis of the Medical Problems Causing Medicaid Patients to Present at a Community Hospital Emergency Room.

## About the Cover

*A pair of Mallards sitting on a rocky shore in the Black Hills, SD area. Photographed by John W. Herbst, Grizzly Bear Nature Photography, Keystone, SD.*



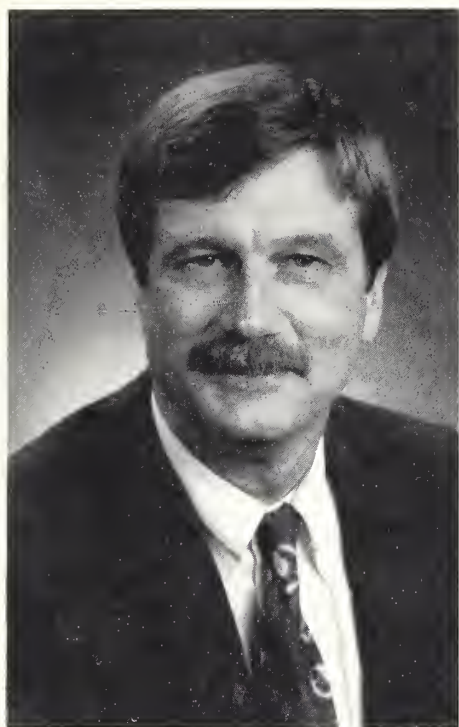


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9. Realize how lucky we are to be in South Dakota
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  - b. We have an effective Medical Association with a well-respected staff.
  - c. We have DakotaCare, the PRO, and the associated expertise needed to survive in the future.
  - d. We don't have a great number of large employers.
  - e. We have a relatively small number of physicians who can and will work together to help build a system that will improve what we have now.

Next Month - The Clinton Plan.

### Now Is The Time For All Good Men And Women To Come To The Aid Of Their Profession

Organizational medicine, managed care, consumers of health care, market share, increasing specialization, astronomical incomes, intraspecialty bickering, government and media pressure and increasing public perception of self-interest have significantly decreased the credibility of individual physicians and physician organizations to act as spokesmen for medicinal care delivery and reform. We have been labeled a "special interest group" by the White House and excluded from participation in Health System Reform.

Now is the time for each physician to look in the mirror and decide to become part of the solution and not the problem.

The solution includes:

1. Be involved (in your community as well as organized medicine)
2. Put patient interest before self interest
3. Put profession before specialty interest



# South Dakota Foundation for Medical Care

## More About The Health Care Quality Improvement Initiative

The South Dakota Foundation for Medical Care (SDFMC) continues development of local improvement projects in response to quality of care concerns for Medicare patients in South Dakota. These projects are collaborative efforts between the PRO and providers that examine and analyze specific process indicators. Both the Health Care Financing Administration (HCFA) and SDFMC emphasize that focus must be placed on process improvements rather than punitive activities. Although HCFA will be releasing this year's hospital mortality reports to the hospitals through the PROs, these reports will not be published in book form and should not be used as quality process indicators.

Improvement project investigative information is obtained from several sources. Hospitals are encouraged to submit ideas or suggestions for potential improvement projects within their facilities. Analysis of Medicare claims data provides the opportunity for pattern analysis of commonly occurring themes. Focus reviews allow the provider and PRO the opportunity for more in-depth study of particular issues. Action plans are developed and improvements are validated through provider and PRO cooperative efforts.

Several South Dakota hospitals have already expressed interest in statistical analysis of Medicare claims data. The database provided by HCFA to SDFMC includes beneficiary demographic information, hospital admission, readmission, diagnostic, treatment and discharge information, and Medicare payment information. You may find SDFMC's statistical analysis of this data to be a useful tool in providing information about potential improvement projects within your facility.

Please feel free to contact me if you have questions or suggestions regarding the Medicare database, available analytical tools, or ideas about local improvement projects.

Bruce Lushbough, MD, MS  
Principal Clinical Coordinator  
South Dakota Foundation for Medical Care  
1323 South Minnesota Ave  
Sioux Falls, SD 57105  
Phone: (605) 336-3505

### It's Either the Real Thing or the Right One Baby — Take Your Pick

**T**he SDSMA House of Delegates passed a resolution in June, the full text of which was printed in the August 1993 Grab Bag. The end of the resolution was as follows:

"Be It Further Resolved, that the South Dakota State Medical Association publicize information about the Commission on Office Laboratory Accreditation (COLA) and encourage that all physicians seek clinical laboratory accreditation through COLA".

COLA is a proposed peer review alternative to the federal inspection/certification process for physician's office laboratories required by CLIA 1988. The voluntary, nonprofit and educational nature of the program sponsored by the AMA, ASIM, AAFP and CAP are in accord with the commitment to quality work promoted by many hospital and private laboratories in this state and throughout the entire nation.

I had the opportunity to speak to Senator Tom Daschle who is traveling the state explaining the proposed Clinton Health Plan. During my conversation with the Senator, I told him that many laboratories had already spent a great deal of time, effort and money trying to comply with CLIA 1988 because we thought when Congress passed a law we were obliged to obey it. I indicated my chagrin to find that the administration is going to basically enforce the bill for some large office laboratories but felt they could not afford to fund the large organization which would be required to carry out the regulatory mandates of the law for smaller laboratories. The high cost of such inspections, of course, was no surprise to the laboratory professionals. I did point out that if we were going to have CLIA regulations, it should apply to all laboratories. A level playing field is certainly not an unreasonable expectation. I also pointed out that through voluntary peer review processes such as COLA, all laboratories including most physician's office laboratories could be surveyed.

The federal involvement could have a small number of inspectors who reinspect laboratories at random to insure that compliance is uniform and effective.

The Senator did mention that the complete repeal of CLIA as advocated by the AMA worried him since CLIA was passed because of what he thought were genuine concerns about laboratory quality. My comment to this was that unless the regulations are applied to all, they should be applied to none.

I also mentioned that there were a number of regulations that would still require substantial modification. The mechanism for this already exists. These included

surprise inspections and whether there should be any waived tests as every test contributes to patient care. Contrary to CLIA tenets, simple tests are often done improperly.

Whatever you feel about COLA, you might try it, we all might even learn something as we demonstrate to the public that we can do quality laboratory work.

John F. Barlow, MD

Editor

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## *AMA Physician Recognition Award*

Congratulations to the physicians in South Dakota who have earned the AMA Physician Recognition Award in the months of May, June, and August, 1993.

### **March**

Robert E. VanDemark, MD, Sr\*

Sioux Falls

### **May**

Mary S. Carpenter, MD\*  
Stephen H. Gehring, MD\*  
Frederick L. Harris, MD\*  
David E. Jenny, MD\*

Winner  
Watertown  
Sioux Falls  
Yankton

Francis P. Kwan, MD\*  
Larry L. Sittner, MD\*  
Donald J. Wingert, MD\*

Rapid City  
Sioux Falls  
Sioux Falls

### **June**

Margaret R. Devick, MD\*  
Theodore L. Kitowski, MD\*  
David G. Kundel, MD\*

Canton  
Brookings  
Mitchell

David W. Ohrt, MD\*  
Calvin D. Sprik, MD\*  
Jon R. Stenberg, MD\*

Sioux Falls  
Yankton  
Rapid City

### **August**

G. Robert Bartron, MD\*  
Lu Ann M. Eidsness, MD\*  
Randall P. Graff, MD\*

Watertown  
Sioux Falls  
Deadwood

James R. Jenke, MD  
Raymundo T. Tan, MD\*

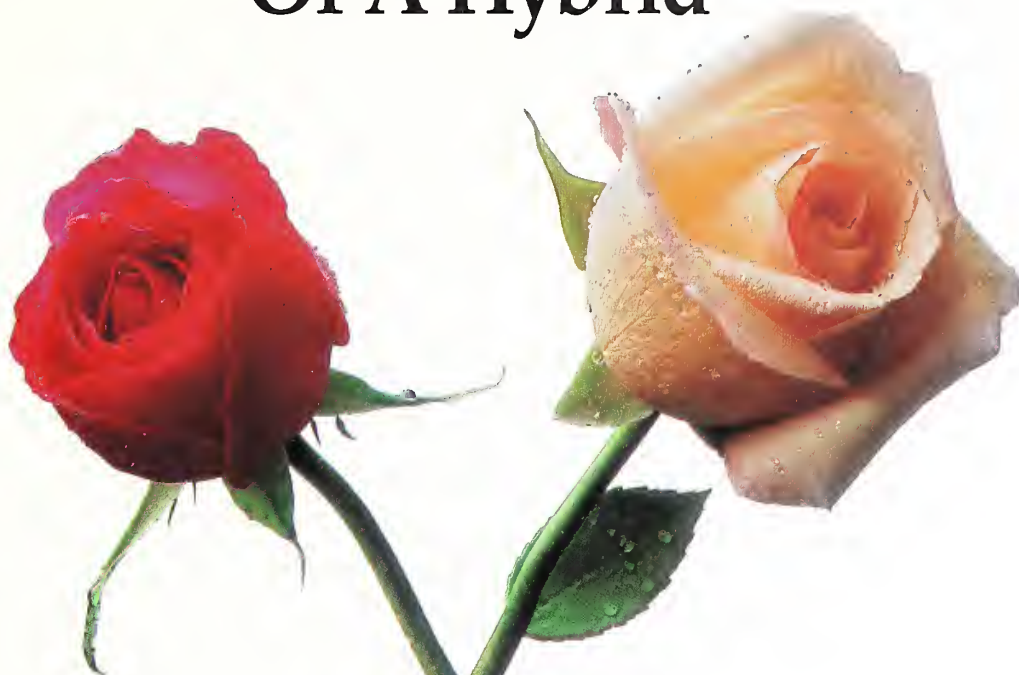
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# Discover The Elegance Of A Hybrid



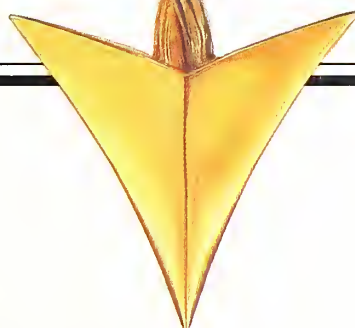
At first glance, it's the *beauty* of a rose that catches the eye. The vibrant color. The delicately shaped petals. But study it more closely, and its *elegance* becomes apparent—a gentle blend of softness and strength.

At first glance, it's the *enhanced performance* of Vaseretic that catches the eye. But study Vaseretic more closely, and its *elegance* becomes apparent. The way its one-tablet, once-a-day dosage minimizes multiple

medications. Minimizes insurance copayments. And minimizes potassium supplementation.

A hybrid *blending of tolerability and power* that's available for the right patient. Vaseretic is indicated for the treatment of hypertension in patients for whom combination therapy is appropriate.

And an elegant discovery for your practice.



**VASERETIC® 10-25**  
Enalapril Maleate-Hydrochlorothiazide

*Next*

Dosage must be individualized; the fixed combination is not for initial therapy.

Evaluation of the hypertensive patient should always include assessment of renal function.

For a Brief Summary of Prescribing Information, see adjacent pages.

USE IN PREGNANCY: When used in pregnancy during the second and third trimesters, ACE inhibitors can cause injury and even death to the developing fetus. When pregnancy is detected, Vaseretic® (Enalapril Maleate-Hydrochlorothiazide) should be discontinued as soon as possible. See WARNINGS, Fetal/Neonatal Morbidity and Mortality.





**USE IN PREGNANCY:** When used in pregnancy during the second and third trimesters, ACE inhibitors can cause injury and even death to the developing fetus. When pregnancy is detected, VASERETIC (Enalapril Maleate-Hydrochlorothiazide) should be discontinued as soon as possible. See WARNINGS, Fetal/Neonatal Morbidity and Mortality.

**CONTRAINDICATIONS:** VASERETIC is contraindicated in patients who are hypersensitive to any component of this product and in patients with a history of angioedema related to previous treatment with an angiotensin converting enzyme inhibitor. Because of the hydrochlorothiazide component, this product is contraindicated in patients with anuria or hypersensitivity to other sulfonamide-derived drugs.

**WARNINGS:** General, Enalapril Maleate, Hypotension: Excessive hypotension was rarely seen in uncomplicated hypertensive patients but is a possible consequence of enalapril use in severely salt/volume depleted persons such as those treated vigorously with diuretics or patients on dialysis.

Syncope has been reported in 13 percent of patients receiving VASERETIC. In patients receiving enalapril alone, the incidence of syncope is 0.5 percent. The overall incidence of syncope may be reduced by proper titration of the individual components. (See PRECAUTIONS, Drug Interactions, and ADVERSE REACTIONS.)

In patients with severe congestive heart failure, with or without associated renal insufficiency, excessive hypotension has been observed and may be associated with oliguria and/or progressive azotemia, and rarely with acute renal failure and/or death. Because of the potential fall in blood pressure in these patients, therapy should be started under very close medical supervision. Such patients should be followed closely for the first two weeks of treatment and whenever the dose of enalapril and/or diuretic is increased. Similar considerations may apply to patients with ischemic heart or cerebrovascular disease, in whom an excessive fall in blood pressure could result in a myocardial infarction or cerebrovascular accident.

If hypotension occurs, the patient should be placed in the supine position and, if necessary, receive an intravenous infusion of normal saline. A transient hypotensive response is not a contraindication to further doses, which usually can be given without difficulty once the blood pressure has increased after volume expansion.

**Angioedema:** Angioedema of the face, extremities, lips, tongue, glottis and/or larynx has been reported in patients treated with angiotensin converting enzyme inhibitors, including enalapril. In such cases VASERETIC should be promptly discontinued and appropriate therapy and monitoring should be provided until complete and sustained resolution of signs and symptoms has occurred. In instances where swelling has been confined to the face and lips the condition has generally resolved without treatment, although antihistamines have been useful in relieving symptoms. Angioedema associated with laryngeal edema may be fatal. Where there is involvement of the tongue, glottis or larynx, likely to cause airway obstruction, appropriate therapy, e.g., subcutaneous epinephrine solution 1:1000 (0.3 mL to 0.5 mL) and/or measures necessary to ensure a patent airway, should be promptly provided. (See ADVERSE REACTIONS.)

Patients with a history of angioedema unrelated to ACE inhibitor therapy may be at increased risk of angioedema while receiving an ACE inhibitor (see also CONTRAINDICATIONS).

**Neutropenia/Agranulocytosis:** Another angiotensin converting enzyme inhibitor, captopril, has been shown to cause agranulocytosis and bone marrow depression, rarely in uncomplicated patients but more frequently in patients with renal impairment especially if they also have a collagen vascular disease. Available data from clinical trials of enalapril are insufficient to show that enalapril does not cause agranulocytosis at similar rates. Marketing experience has revealed several cases of neutropenia or agranulocytosis in which a causal relationship to enalapril cannot be excluded. Periodic monitoring of white blood cell counts in patients with collagen vascular disease and renal disease should be considered.

**Hydrochlorothiazide:** Thiazides should be used with caution in severe renal disease. In patients with renal disease, thiazides may precipitate azotemia. Cumulative effects of the drug may develop in patients with impaired renal function.

Thiazides should be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma.

Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma.

The possibility of exacerbation or activation of systemic lupus erythematosus has been reported.

Lithium generally should not be given with thiazides (see PRECAUTIONS, Drug Interactions, Enalapril Maleate and Hydrochlorothiazide).

**Pregnancy, Enalapril-Hydrochlorothiazide:** There was no teratogenicity in rats given up to 90 mg/kg/day of enalapril (150 times the maximum human dose) in combination with 10 mg/kg/day of hydrochlorothiazide (2 1/2 times the maximum human dose) or in mice given up to 30 mg/kg/day of enalapril (50 times the maximum human dose) in combination with 10 mg/kg/day of hydrochlorothiazide (2 1/2 times the maximum human dose). At these doses, fetotoxicity expressed as a decrease in average fetal weight occurred in both species. No fetotoxicity occurred at lower doses; 30/10 mg/kg/day of enalapril-hydrochlorothiazide in rats and 10/10 mg/kg/day of enalapril-hydrochlorothiazide in mice.

When used in pregnancy during the second and third trimesters, ACE inhibitors can cause injury and even death to the developing fetus. When pregnancy is detected, VASERETIC should be discontinued as soon as possible. (See Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality, below.)

**Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality:** ACE inhibitors can cause fetal and neonatal morbidity and death when administered to pregnant women. Several dozen cases have been reported in the world literature. When pregnancy is detected, ACE inhibitors should be discontinued as soon as possible.

The use of ACE inhibitors during the second and third trimesters of pregnancy has been associated with fetal and neonatal injury, including hypotension, neonatal skull hypoplasia, anuria, reversible or irreversible renal failure, and death. Oligohydramnios has also been reported, presumably resulting from decreased fetal renal function; oligohydramnios in this setting has been associated with fetal limb contractures, craniofacial deformation, and hypoplastic lung development. Prematurity, intrauterine growth retardation, and patent ductus arteriosus have also been reported, although it is not clear whether these occurrences were due to the ACE-inhibitor exposure.

These adverse effects do not appear to have resulted from intrauterine ACE-inhibitor exposure that has been limited to the first trimester. Mothers whose embryos and fetuses are exposed to ACE inhibitors only during the first trimester should be so informed. Nonetheless, when patients become pregnant, physicians should make every effort to discontinue the use of VASERETIC as soon as possible.

Rarely (probably less often than once in every thousand pregnancies), no

alternative to ACE inhibitors will be found. In these rare cases, the mothers should be apprised of the potential hazards to their fetuses, and serial ultrasound examinations should be performed to assess the intraamniotic environment.

If oligohydramnios is observed, VASERETIC should be discontinued unless it is considered lifesaving for the mother. Contraction stress testing (CST), a non-stress test (NST), or biophysical profiling (BPP) may be appropriate, depending upon the week of pregnancy. Patients and physicians should be aware, however, that oligohydramnios may not appear until after the fetus has sustained irreversible injury.

Infants with histories of *in utero* exposure to ACE inhibitors should be closely observed for hypotension, oliguria, and hyperkalemia. If oliguria occurs, attention should be directed toward support of blood pressure and renal perfusion. Exchange transfusion or dialysis may be required as means of reversing hypotension and/or substituting for disordered renal function. Enalapril, which crosses the placenta, has been removed from neonatal circulation by peritoneal dialysis with some clinical benefit, and theoretically may be removed by exchange transfusion, although there is no experience with the latter procedure.

No teratogenic effects of enalapril were seen in studies of pregnant rats and rabbits. On a mg/kg basis, the doses used were up to 333 times (in rats), and 50 times (in rabbits) the maximum recommended human dose.

**Hydrochlorothiazide, Teratogenic Effects:** Reproduction studies in the rabbit, the mouse and the rat at doses up to 100 mg/kg/day (50 times the human dose) showed no evidence of external abnormalities of the fetus due to hydrochlorothiazide. Hydrochlorothiazide given in a two-litter study in rats at doses of 4-5.6 mg/kg/day (approximately 1-2 times the usual daily human dose) did not impair fertility or produce birth abnormalities in the offspring. Thiazides cross the placental barrier and appear in cord blood.

**Neonatal/Infant Effects:** These may include fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions which have occurred in the adult.

**PRECAUTIONS:** General, Enalapril Maleate, Impaired Renal Function. As a consequence of inhibiting the renin-angiotensin-aldosterone system, changes in renal function may be anticipated in susceptible individuals. In patients with severe congestive heart failure whose renal function may depend on the activity of the renin-angiotensin-aldosterone system, treatment with angiotensin converting enzyme inhibitors, including enalapril, may be associated with oliguria and/or progressive azotemia and rarely with acute renal failure and/or death.

In clinical studies in hypertensive patients with unilateral or bilateral renal artery stenosis, increases in blood urea nitrogen and serum creatinine were observed in 20 percent of patients. These increases were almost always reversible upon discontinuation of enalapril and/or diuretic therapy. In such patients renal function should be monitored during the first few weeks of therapy.

Some patients with hypertension or heart failure with no apparent pre-existing renal vascular disease have developed increases in blood urea and serum creatinine, usually minor and transient, especially when enalapril has been given concomitantly with a diuretic. This is more likely to occur in patients with pre-existing renal impairment. Dosage reduction of enalapril and/or discontinuation of the diuretic may be required.

**Evaluation of the hypertensive patient should always include assessment of renal function.**

**Hemodialysis Patients:** Anaphylactoid reactions have been reported in patients dialyzed with high-flux membranes (e.g., AN 69) and treated concomitantly with an ACE inhibitor. In these patients consideration should be given to using a different type of dialysis membrane or a different class of antihypertensive agent.

**Hyperkalemia:** Elevated serum potassium (greater than 5.7 mEq/L) was observed in approximately one percent of hypertensive patients in clinical trials treated with enalapril alone. In most cases these were isolated values which resolved despite continued therapy, although hyperkalemia was a cause of discontinuation of therapy in 0.28 percent of hypertensive patients. Hyperkalemia was less frequent (approximately 0.1 percent) in patients treated with enalapril plus hydrochlorothiazide. Risk factors for the development of hyperkalemia include renal insufficiency, diabetes mellitus, and the concomitant use of potassium-sparing diuretics, potassium supplements and/or potassium-containing salt substitutes, which should be used cautiously, if at all with enalapril. (See Drug Interactions.)

**Cough:** Cough has been reported with the use of ACE inhibitors. Characteristically, the cough is nonproductive, persistent and resolves after discontinuation of therapy. ACE inhibitor-induced cough should be considered as part of the differential diagnosis of cough.

**Surgery/Anesthesia:** In patients undergoing major surgery or during anesthesia with agents that produce hypotension, enalapril may block angiotensin II formation secondary to compensatory renin release. If hypotension occurs and is considered to be due to this mechanism, it can be corrected by volume expansion.

**Hydrochlorothiazide:** Periodic determination of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals. All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance: hyponatremia, hypochloremic alkalosis, and hypokalemia. Serum and urine electrolyte determinations are particularly important when the patient is vomiting excessively or receiving parenteral fluids. Warning signs or symptoms of fluid and electrolyte imbalance, irrespective of cause, include dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, confusion, seizures, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting.

Hyperkalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or after prolonged therapy. Interference with adequate oral electrolyte intake will also contribute to hyperkalemia. Hyperkalemia may cause cardiac arrhythmias and may also sensitize or exaggerate the response of the heart to the toxic effects of digitalis (e.g., increased ventricular irritability). Because enalapril reduces the production of aldosterone, concomitant therapy with enalapril attenuates the diuretic-induced potassium loss (see Drug Interactions, Agents Increasing Serum Potassium).

Although any chloride deficit is generally mild and usually does not require specific treatment except under extraordinary circumstances (as in liver disease or renal disease), chloride replacement may be required in the

treatment of metabolic alkalosis.

Dilutional hyponatremia may occur in edematous patients in hot weather; appropriate therapy is water restriction, rather than administration of salt except in rare instances when the hyponatremia is life-threatening. In actual salt depletion, appropriate replacement is the therapy of choice.

Hyperuricemia may occur or frank gout may be precipitated in certain patients receiving thiazide therapy.

In diabetic patients dosage adjustments of insulin or oral hypoglycemic agents may be required. Hyperglycemia may occur with thiazide diuretics. Thus latent diabetes mellitus may become manifest during thiazide therapy.

The antihypertensive effects of the drug may be enhanced in the postsympathetic patient.

If progressive renal impairment becomes evident consider withholding or discontinuing diuretic therapy.

Thiazides have been shown to increase the urinary excretion of magnesium; this may result in hypomagnesemia.

Thiazides may decrease urinary calcium excretion. Thiazides may cause intermittent and slight elevation of serum calcium in the absence of known disorders of calcium metabolism. Marked hypercalcemia may be evidence of hidden hyperparathyroidism. Thiazides should be discontinued before carrying out tests for parathyroid function.

Increases in cholesterol and triglyceride levels may be associated with thiazide diuretic therapy.

**Information for Patients, Angioedema:** Angioedema, including laryngeal edema, may occur especially following the first dose of enalapril. Patients should be so advised and told to report immediately any signs or symptoms suggesting angioedema (swelling of face, extremities, eyes, lips, tongue, difficulty in swallowing or breathing) and to take no more drug until they have consulted with the prescribing physician.

**Hypotension:** Patients should be cautioned to report lightheadedness especially during the first few days of therapy. If actual syncope occurs, the patients should be told to discontinue the drug until they have consulted with the prescribing physician.

All patients should be cautioned that excessive perspiration and dehydration may lead to an excessive fall in blood pressure because of reduction in fluid volume. Other causes of volume depletion such as vomiting or diarrhea may also lead to a fall in blood pressure; patients should be advised to consult with the physician.

**Hyperkalemia:** Patients should be told not to use salt substitutes containing potassium without consulting their physician.

**Neutropenia:** Patients should be told to report promptly any indication of infection (e.g., sore throat, fever) which may be a sign of neutropenia.

**Pregnancy:** Female patients of childbearing age should be told about the consequences of second- and third-trimester exposure to ACE inhibitors, and they should also be told that these consequences do not appear to have resulted from intrauterine ACE-inhibitor exposure that has been limited to the first trimester. These patients should be asked to report pregnancies to their physicians as soon as possible.

**NOTE:** As with many other drugs, certain advice to patients being treated with VASERETIC is warranted. This information is intended to aid in the safe and effective use of this medication. It is not a disclosure of all possible adverse or intended effects.

**Drug Interactions: Enalapril Maleate, Hypotension—Patients on Diuretic Therapy:** Patients on diuretics and especially those in whom diuretic therapy was recently instituted, may occasionally experience an excessive reduction of blood pressure after initiation of therapy with enalapril. The possibility of hypotensive effects with enalapril can be minimized by either discontinuing the diuretic or increasing the salt intake prior to initiation of treatment with enalapril. If it is necessary to continue the diuretic, provide medical supervision for at least two hours and until blood pressure has stabilized for at least an additional hour. (See WARNINGS.)

**Agents Causing Renin Release:** The antihypertensive effect of enalapril is augmented by antihypertensive agents that cause renin release (e.g., diuretics).

**Other Cardiovascular Agents:** Enalapril has been used concomitantly with beta adrenergic-blocking agents, methyldopa, nitrates, calcium-blocking agents, hydralazine and prazosin without evidence of clinically significant adverse interactions.

**Agents Increasing Serum Potassium:** Enalapril attenuates diuretic-induced potassium loss. Potassium-sparing diuretics (e.g., spironolactone, triamterene, or amiloride), potassium supplements, or potassium-containing salt substitutes may lead to significant increases in serum potassium. Therefore, if concomitant use of these agents is indicated because of demonstrated hypokalemia they should be used with caution and with frequent monitoring of serum potassium.

**Lithium:** Lithium toxicity has been reported in patients receiving lithium concomitantly with drugs which cause elimination of sodium, including ACE inhibitors. A few cases of lithium toxicity have been reported in patients receiving concomitant enalapril and lithium and were reversible upon discontinuation of both drugs. It is recommended that serum lithium levels be monitored frequently if enalapril is administered concomitantly with lithium. Hydrochlorothiazide: When administered concurrently the following drugs may interact with thiazide diuretics:

Alcohol, barbiturates, or narcotics—potentiation of orthostatic hypotension may occur.

Antidiabetic drugs (oral agents and insulin)—dosage adjustment of the antidiabetic drug may be required.

Antihypertensive drugs—additive effect or potentiation.

**Cholestyramine and colestipol resins:** Absorption of hydrochlorothiazide is impaired in the presence of anionic exchange resins. Single doses of either cholestyramine or colestipol resins bind the hydrochlorothiazide and reduce its absorption from the gastrointestinal tract by up to 85 and 43 percent, respectively.

**Corticosteroids, ACTH—**intensified electrolyte depletion, particularly hypokalemia.

**Presor amines (e.g., norepinephrine)**—possible decreased response to presor amines but not sufficient to preclude their use.

**Skeletal muscle relaxants, nondepolarizing (e.g., tubocurarine)**—possible increased responsiveness to the muscle relaxant.

**Lithium**—should not generally be given with diuretics. Diuretic agents reduce the renal clearance of lithium and add a high risk of lithium toxicity. Refer to the package insert for lithium preparations before use of such preparations with VASERETIC.

**Non-steroidal Anti-inflammatory Drugs:** In some patients, the administration of a non-steroidal anti-inflammatory agent can reduce the diuretic, natriuretic, and antihypertensive effects of loop, potassium-sparing and thiazide diuretics. Therefore, when VASERETIC and non-steroidal anti-inflammatory agents are used concomitantly, the patient should be observed closely to determine if the desired effect of the diuretic is obtained.

**Carcinogenesis, Mutagenesis, Impairment of Fertility:** Enalapril in combination with hydrochlorothiazide was not mutagenic in the Ames microtubule mutagen test with or without metabolic activation. Enalapril-hydrochlorothiazide did not produce DNA single strand breaks in an *in vitro* alkaline elution assay in rat hepatocytes or chromosomal aberrations in an *in vivo* mouse

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bone marrow assay.

**Enalapril Maleate:** There was no evidence of a tumorigenic effect when enalapril was administered for 106 weeks to rats at doses up to 90 mg/kg/day (150 times\* the maximum daily human dose). Enalapril has also been administered for 94 weeks to male and female mice at doses up to 90 and 180 mg/kg/day, respectively, (150 and 300 times\* the maximum daily dose for humans) and showed no evidence of carcinogenicity.

Neither enalapril maleate nor the active diacid was mutagenic in the Ames microbial mutagen test with or without metabolic activation. Enalapril was also negative in the following genotoxicity studies: rec-assay, reverse mutation assay with *E. coli*, sister chromatid exchange with cultured mammalian cells, and the micronucleus test with mice, as well as in an *in vitro* cytogenetic study using mouse bone marrow.

There were no adverse effects on reproductive performance in male and female rats treated with 10 to 90 mg/kg/day of enalapril.

**Hydrochlorothiazide:** Two-year feeding studies in mice and rats conducted under the auspices of the National Toxicology Program (NTP) uncovered no evidence of a carcinogenic potential of hydrochlorothiazide in female mice (at doses of up to approximately 600 mg/kg/day) or in male and female rats (at doses of up to approximately 100 mg/kg/day). The NTP, however, found equivocal evidence for hepatocarcinogenicity in male mice.

Hydrochlorothiazide was not genotoxic *in vitro* in the Ames mutagenicity assay of *Salmonella typhimurium* strains TA 98, TA 100, TA 1535, TA 1537, and TA 1538 and in the Chinese Hamster Ovary (CHO) test for chromosomal aberrations, or *in vivo* in assays using mouse germinal cell chromosomes, Chinese hamster bone marrow chromosomes, and the *Drosophila* sex-linked recessive lethal trait gene. Positive test results were obtained only in the *in vitro* CHO Sister Chromatid Exchange (clastogenicity) and in the Mouse Lymphoma Cell (mutagenicity) assays, using concentrations of hydrochlorothiazide from 43 to 1300 µg/mL, and in the *Aspergillus nidulans* non-disjunction assay at an unspecified concentration.

Hydrochlorothiazide had no adverse effects on the fertility of mice and rats of either sex in studies wherein these species were exposed, via their diet, to doses of up to 100 and 4 mg/kg, respectively, prior to conception and throughout gestation.

**Pregnancy, Pregnancy Categories C** (first trimester) and **D** (second and third trimesters). See WARNINGS, Pregnancy, Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality.

**Nursing Mothers:** Enalapril and enalaprilat are detected in human milk in trace amounts. Thiazides do appear in human milk. Because of the potential for serious reactions in nursing infants from either drug, a decision should be made whether to discontinue nursing or to discontinue VASERETIC, taking into account the importance of the drug to the mother.

**Adverse Reactions:** VASERETIC has been evaluated for safety in more than 1500 patients, including over 300 patients treated for one year or more. In clinical trials with VASERETIC no adverse experiences peculiar to this combination drug have been observed. Adverse experiences that have occurred, have been limited to those that have been previously reported with enalapril or hydrochlorothiazide.

The most frequent clinical adverse experiences in controlled trials were: dizziness (8.6 percent), headache (5.5 percent), fatigue (3.9 percent) and cough (3.5 percent). Adverse experiences occurring in greater than two percent of patients treated with VASERETIC in controlled clinical trials were: muscle cramps (2.7 percent), nausea (2.5 percent), asthenia (2.4 percent), orthostatic effects (2.3 percent), impotence (2.2 percent), and diarrhea (2.1 percent).

Clinical adverse experiences occurring in 0.5 to 2.0 percent of patients in controlled trials included: *Body As A Whole:* Syncope, chest pain, abdominal pain; *Cardiovascular:* Orthostatic hypotension, palpitation, tachycardia; *Digestive:* Vomiting, dyspepsia, constipation, flatulence, dry mouth; *Nervous/psychiatric:* Insomnia, nervousness, paresthesia, somnolence, vertigo; *Skin:* Pruritus, rash; *Other:* Dyspnea, gout, back pain, arthralgia, diaphoresis, decreased libido, tinnitus, urinary tract infection.

**Angioedema:** Angioedema has been reported in patients receiving VASERETIC (0.6 percent). Angioedema associated with laryngeal edema may be fatal. If angioedema of the face, extremities, lips, tongue, glottis and/or larynx occurs, treatment with VASERETIC should be discontinued and appropriate therapy instituted immediately. (See WARNINGS.)

**Hypotension:** In clinical trials, adverse effects relating to hypotension occurred as follows: hypotension (0.9 percent), orthostatic hypotension (1.5 percent), other orthostatic effects (2.3 percent). In addition syncope occurred in 1.3 percent of patients. (See WARNINGS.)

**Cough:** See PRECAUTIONS, Cough.

**Clinical Laboratory Test Findings: Serum Electrolytes:** See PRECAUTIONS.  
**Creatinine, Blood Urea Nitrogen:** In controlled clinical trials minor increases in blood urea nitrogen and serum creatinine, reversible upon discontinuation of therapy, were observed in about 0.6 percent of patients with essential hypertension treated with VASERETIC. More marked increases have been reported in other enalapril experience. Increases are more likely to occur in patients with renal artery stenosis. (See PRECAUTIONS.)

**Serum Uric Acid, Glucose, Magnesium, and Calcium:** See PRECAUTIONS.

**Hemoglobin and Hematocrit:** Small decreases in hemoglobin and hematocrit (mean decreases of approximately 0.3 g percent and 1.0 vol percent, respectively) occur frequently in hypertensive patients treated with VASERETIC but are rarely of clinical importance unless another cause of anemia coexists. In clinical trials, less than 0.1 percent of patients discontinued therapy due to anemia.

**Liver Function Tests:** Rarely, elevations of liver enzymes and/or serum bilirubin have occurred. Other adverse reactions that have been reported with the individual components are listed below and, within each category, are in order of decreasing severity.

**Enalapril Maleate:** Enalapril has been evaluated for safety in more than 10,000 patients. In clinical trials adverse reactions which occurred with enalapril were also seen with VASERETIC. However, since enalapril has been marketed, the following adverse reactions have been reported: *Body As A Whole:* Anaphylactoid reactions (see PRECAUTIONS, Hemodialysis Patients); *Cardiovascular:* Cardiac arrest, myocardial infarction or cerebrovascular accident, possibly secondary to excessive hypotension in high risk patients (see WARNINGS, Hypotension); pulmonary embolism and infarction; pulmonary edema, rhythm disturbances including atrial tachycardia and bradycardia; atrial fibrillation; hypotension; angina pectoris; *Digestive:* Ileus, pancreatitis, hepatic failure, hepatitis (hepatocellular [proven on rechallenge] or cholestatic jaundice), melena, anorexia, glossitis, stomatitis, dry mouth; *Hematologic:* Rare cases of neutropenia, thrombocytopenia and bone marrow depression. Hemolytic anemia, including cases of hemolysis in patients with G-6-PD deficiency, has been reported; a causal relationship to enalapril has not been established. *Nervous System/Psychiatric:* Depression, confusion, ataxia, peripheral neuropathy (e.g., paresthesia, dysesthesia); *Urogenital:* Renal failure, oliguria, renal dysfunction (see PRECAUTIONS), flank pain, pyelonephritis; *Respiratory:* Pulmonary infiltrates, bronchospasm, pneumonia, bronchitis, rhinorrhea, sore throat and hoarseness, asthma, upper respiratory infection; *Skin:* Exfoliative dermatitis, toxic epidermal necrolysis, Stevens-Johnson syndrome, herpes zoster, erythema multiforme, urticaria, pemphigus, alopecia, flushing, photosensitivity; *Special Senses:* Blurred vision, taste alteration, anosmia, conjunctivitis, dry eyes, tearing.

**Miscellaneous:** A symptom complex has been reported which may include a positive ANA, an elevated erythrocyte sedimentation rate, arthralgia/arthritis, myalgia/myositis, fever, serositis, vasculitis, leukocytosis, eosinophilia, photosensitivity, rash and other dermatologic manifestations.

**Fetal/Neonatal Morbidity and Mortality:** See WARNINGS, Pregnancy, Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality.

**Hydrochlorothiazide:** *Body as a Whole:* Weakness; *Digestive:* Pancreatitis, jaundice (intrahepatic cholestatic jaundice), sialadenitis, cramping, gastric irritation, anorexia; *Hematologic:* Aplastic anemia, agranulocytosis, leukopenia, hemolytic anemia, thrombocytopenia; *Hypersensitivity:* Purpura, photosensitivity, urticaria, necrotizing angitis (vasculitis and cutaneous vasculitis); fever, respiratory distress including pneumonitis and pulmonary edema, anaphylactic reactions; *Musculoskeletal:* Muscle spasm; *Nervous System/Psychiatric:* Restlessness; *Renal:* Renal failure, renal dysfunction, interstitial nephritis (see WARNINGS); *Skin:* Erythema multiforme including Stevens-Johnson syndrome, exfoliative dermatitis including toxic epidermal necrolysis, alopecia; *Special Senses:* Transient blurred vision, xanthopsia.

\* Based on patient weight of 50 kg.

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# Gastrocolic Fistula-Secondary to Aspirin Abuse

*Steven H. Gutnik, MD; Doug Willmott, BS; and Joel Ziebarth, MD*

## ABSTRACT

Gastrocolic fistula is a rare complication of benign gastric ulcer disease. It has been associated more commonly, in the past, with marginal ulceration following gastrojejunostomy for peptic ulcer disease. We will describe a classic case of gastrocolic fistula as a complication of acetylsalicylic acid abuse in a middle aged female with a remote history of aspirin induced ulcer. Her presentation was classic and required a surgical approach with excellent recovery. We will describe the clinical, radiographic, endoscopic and surgical aspects of this interesting and unusual disorder.

## CASE PRESENTATION

This 49 year old white female with a remote history of aspirin induced gastric ulcer presented with chronic diarrhea, intermittent nausea and vomiting, halitosis, and a progressive 80 pound weight loss over a period of 12 months. She continued to consume between 8-12 aspirin per day for a variety of arthritic complaints. Her physical examination revealed afebrile status, her blood pressure was 125/61, pulse 81 and respiration 16. She was pale, her mucous membranes were somewhat dry. Specifically her abdominal examination revealed obesity but no palpable masses or significant tenderness was appreciated.

Laboratory work on admission revealed a WBC count of 10,000, hemoglobin 7.8, hematocrit 24.8, MCV 74.4, and platelet count of 640,000. Magnesium was 1.9, calcium 7.9, total protein 6.1, albumin 1.5, and protime 12.1. Her cholesterol was low at 77.

The patient underwent an upper GI x-ray which revealed a large gastrocolic fistula on the greater curvature, body of the stomach. The fistula was associated directly with the distal transverse colon. (see Figure 1) An esophagogastroduodenoscopy was performed which revealed an ulcerated fistula on the greater curvature, body of the stomach. The gastrocolic fistula measured at least 2.0 cm in size and was very easy to intubate. (see Figure 2) The stomach was additionally filled with feculent debris. The fistula was biopsied and revealed fibropurulent debris and underlying granulation tissue compatible with ulceration.

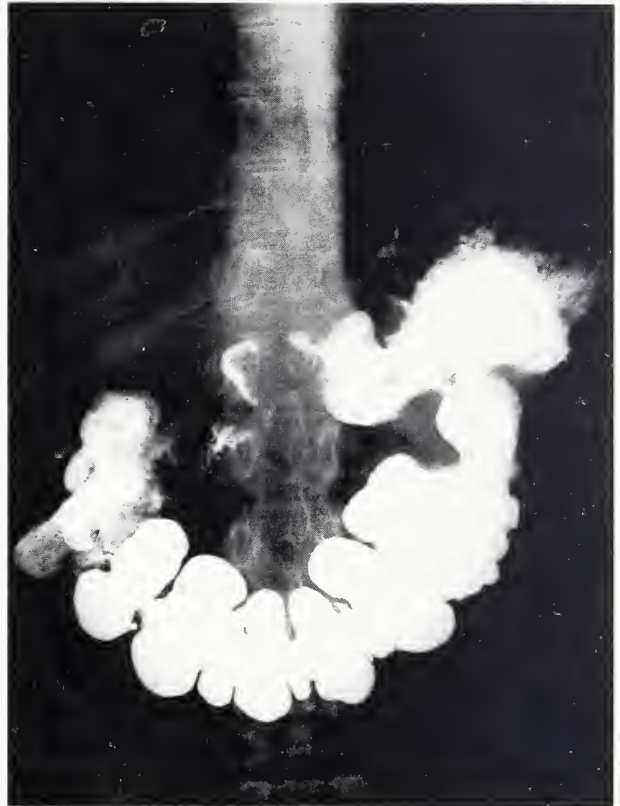


Figure 1

Upper GI X-ray demonstrates communication between the stomach and distal transverse colon.

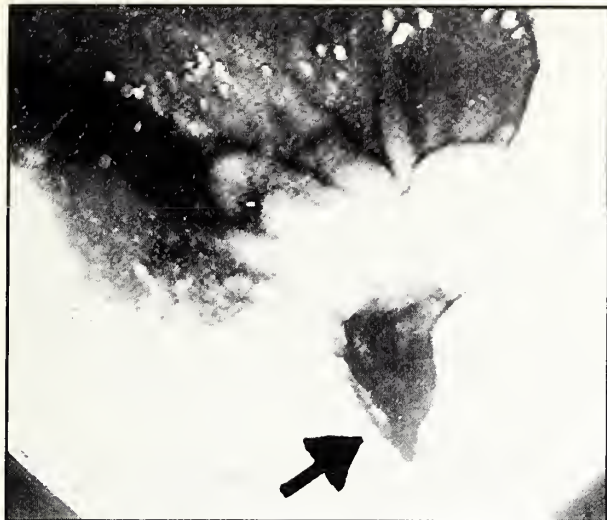


Figure 2

Endoscopic view of fistula-gastric side

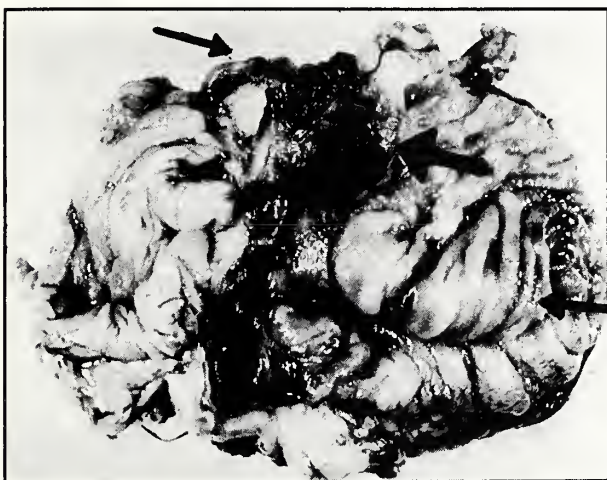


Figure 3

Surgical specimen reveals stomach mucosa (top arrow) adjacent to fistula tract (large arrow) leading into distal transverse colon (lower arrow).

The patient was started on hyperalimentation and was ultimately taken to the operating room where a one stage procedure consisting of excision of the gastrocolic fistula, segmental colon resection and gastrojejunostomy with bilateral vagotomy was performed. (see Figure 3) The patient tolerated the procedure well and was discharged in stable condition after a fourteen day hospitalization.

## DISCUSSION

Gastrocolic fistula was first described in 1755 by Haller.<sup>1</sup> The most common cause was noted to be marginal ulceration from previous partial gastric resection or gastrojejunostomy without vagotomy.<sup>2,3</sup> The two

more common causes of gastrocolic fistula in recent years are malignant gastric or colon diseases, and benign gastric or duodenal ulcer disease associated with the use of anti-inflammatory drugs.<sup>4,6</sup> Most patients with gastrocolic fistula are middle aged females and about 75% are associated with aspirin, nonsteroidal anti-inflammatory drugs and less commonly with steroids.<sup>7</sup> More rarely, these fistula are associated with other disorders such as diverticulitis, inflammatory bowel disease, pancreatic abscess, irradiation, gastrointestinal tuberculosis, syphilis and iatrogenic etiology.

Symptoms which should suggest the diagnosis include abdominal pain, diarrhea, weight loss, vomiting, gastrointestinal bleeding, fecal eructation/fecal vomiting, and melena.<sup>2</sup> (see Table I)

Table I

Clinical Presentation of 42 Patients with Gastrocolic Fistula Secondary to Unoperated Gastric and Duodenal Ulcers (from Akwari, et al<sup>2</sup>)

| Symptom                        | No of Patients | %  |
|--------------------------------|----------------|----|
| Abdominal Pain                 | 35             | 83 |
| Diarrhea                       | 31             | 74 |
| Weight Loss                    | 31             | 74 |
| Vomiting                       | 31             | 74 |
| GI Bleeding                    | 22             | 52 |
| Foul eructation/fecal Vomiting | 23             | 55 |
| Melena                         | 15             | 38 |

The diagnosis is established most reliably by a barium enema. This will reveal the fistula in at least 95% of patients.<sup>8</sup> An upper GI x-ray is variably reported to display gastrocolic fistula in 20% to 50% of patients.<sup>8</sup> Endoscopy is not proven to be of great benefit diagnostically.

The favored surgical approach is a hemigastrectomy and resection of the involved segment of colon en bloc.<sup>2</sup> The mortality with this type of operation should be less than 8%. Recurrence rates should additionally be small. Other types of surgery can be performed but are generally less effective. This patient underwent resection of a segment of colon with excision of fistula and ulcer with associated gastrojejunostomy and vagotomy. This operation served the patient very well, but is not the most common operation which is generally performed. The patient has had a good result and continues to do well at this time without evidence of clinical recurrence of a gastrocolic fistula.

Finally, it should be noted that several case reports of successfully healed gastrocolic fistula treated medically with histamine blockers have been reported.<sup>9</sup> This is an unusual and unproven modality and is generally used for seriously ill patients.<sup>5</sup>



## AUTHORS

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**Action:** Yohimbine blocks presynaptic alpha-2 adrenergic receptors. Its action on peripheral blood vessels resembles that of reserpine, though it is weaker and of short duration. Yohimbine's peripheral autonomic nervous system effect is to increase parasympathetic (cholinergic) and decrease sympathetic (adrenergic) activity. It is to be noted that in male sexual performance, erection is linked to cholinergic activity and to alpha-2 adrenergic blockade which may theoretically result in increased penile inflow, decreased penile outflow or both.

Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalamic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it; however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

**Indications:** Yocon® is indicated as a sympatholytic and mydriatic. It may have activity as an aphrodisiac.

**Contraindications:** Renal diseases, and patient's sensitive to the drug. In view of the limited and inadequate information at hand, no precise tabulation can be offered of additional contraindications.

**Warning:** Generally, this drug is not proposed for use in females and certainly must not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

**Adverse Reactions:** Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug.<sup>1,2</sup> Also dizziness, headache, skin flushing reported when used orally.<sup>1,3</sup>

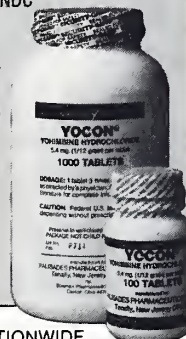
**Dosage and Administration:** Experimental dosage reported in treatment of erectile impotence.<sup>1,3,4</sup> 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to 1/2 tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.<sup>3</sup>

**How Supplied:** Oral tablets of Yocon® 1/12 gr. 5.4 mg in bottles of 100's NDC 53159-001-01 and 1000's NDC 53159-001-10.

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## Rural Health Care Networks in South Dakota

*Sandy Buseman, MS, Loren H. Amundson, MD*

### ABSTRACT

To address health care access concerns, a Regional Coordinated Care Network (RCCN) program, through Robert Wood Johnson Foundation Practice Sights Initiative funding, is being developed by the South Dakota Office of Rural Health. The intent of the initiative is to expand primary and preventive care and, hopefully, permanently reduce the number of Health Professional Shortage Areas (HPSAs) in the state by linking and enhancing providers and services. In rural areas such networking will be crucial for the delivery of health care. Surely, the impact on family physicians will be significant and salutary.

In all of Faulk county, South Dakota, not a single primary health care professional currently provides continuous care. Who, then, provides basic health care to the local people, and what distance must be traveled in order to attain (or deliver) this care? Faulk county is not an exception but a microcosm of the proliferating crises in the provision of health care affecting rural communities. In these areas, where the need for reform is so apparent, improving access to quality primary health care is key. With this goal in mind, communities in three of the state's medically underserved counties (Faulk, Hand and Spink) have discussed networking in order to allow facilities, information and resources to be shared.

The proposed FaRM (for Faulkton, Redfield and Miller) network foretells what is to come, for there remains little doubt that in light of impending national and state reform, networking will be crucial for the continuing delivery of health care services in rural areas. The purpose of this paper is to consider the ramifications of national health care reform for the many nonurban communities in South Dakota and to explore the development of Regional Coordinated Care Networks in the effort to better provide primary health care services for citizens of the state.

### NATIONAL AGENDA

The fundamentals of change will, of course, originate at the national level. While the specifics have yet to be released, the federal framework for reform will likely invoke the principles of managed competition to redefine the delivery of health care. The hypothesis is that under the guise of managed competition, health plans which best improve quality, cut costs, provide access and satisfy patients will be most highly rewarded. Emphasis will be on improving all-around access to primary health care, including preventive services, and containing costs by "managed control" over the options and services available.<sup>1,2</sup>

Improving access is foremost as reform would be futile if it did not reach the people in need. The federal agenda will likely call for a mandated set of basic health

benefits to be adapted to the unique needs of each state. Affordable, comprehensive health care coverage will be universally available, either through cost-sharing of insurance between employer and employee, or, alternatively, through state subsidies for low income and underinsured individuals.<sup>1,3</sup> As cost-sharing encourages efficiency and comprehensive coverage addresses the pervasive phenomenon of cost-shifting, cost control will inevitably be affected.

By improving efficiencies in the use, production and allocation of health care services, cost containment will further define what procedures are available to, and appropriate for, patients. Capitated managed care plans which provide coverage in defined geographic areas will support this effort. Purchasing pools under regulatory authority by the state, called Health Alliances (HAs), will manage the market by selecting the most cost-effective Accountable Health Plans (AHPs) to standardize and provide benefits for consumers. Considering that the contribution of defensive medicine to the abuse of medical technology and the proliferation of unnecessary care is significant, federal health care reform aimed at cost containment will need to include tort reform.<sup>3,5</sup> Without tort reform physicians will continue to "defend" themselves and their practices, boosting health care costs all the more.

Reform is also apt to call for changes in clinical policy, including the adoption of utilization management techniques and practice parameters in order to control costs and "provide physicians a useful distillation of existing knowledge in a more complete form than has been available".<sup>6</sup> Currently a preponderance of resources is spent on extreme measures, such as intensive care for the terminally ill, and relatively little is directed towards wellness education of the public at large. Reform must reinforce the notion that the availability of high technology does not necessarily justify its use.<sup>4</sup> The emphasis instead will be on prevention. Along with promoting preventive services, reform will laud the concept of continuum of patient care. Inherently, the position of the family physician will be enhanced.



The role of the family physician will be greatly impacted by reform. Clancy, Gold and Wall have written that "an emphasis on primary care will be a prerequisite to affordable health care", and that despite the uncertainty surrounding the national agenda, any reform in the delivery of health care will call for an expansion of primary care services.<sup>7</sup> The existing corps of health care providers is overspecialized and maldistributed. Reform must address both of these issues to help achieve the goals of access improvement and cost containment. To support the growth of primary and preventive care, federal resources will need to be reallocated.<sup>3,5</sup> Mullan, Rivo and Politzer have argued that because the training of physicians consumes a great deal of public investment, the profession should itself be accountable to public needs.<sup>8</sup>

In the age of reform, family physicians will likely function as points of entry—called "gatekeepers" by some—into the health care delivery system. This role supports cost efficiency while providing a continuum of care to the patient.<sup>3,7,9</sup> With the broad base of patients served and the wide array of services rendered, the power vested in family physicians is sure to be enhanced; family physicians, themselves, are certain to augment the delivery of primary health care.

### STATE REFORM AND REGIONAL COORDINATED CARE NETWORKS

It will be the responsibility of each state to adapt the emerging framework of reform to its own unique environment. Given the great diversity in demographics, states should be granted discretion in implementing federal guidelines for reform. The principles of managed competition (the hallmark of impending reform) must be responsive to any given community's characteristics.<sup>2</sup>

At issue is how these guidelines will affect rural areas, for "managed competition" is not feasible in rural areas where competition among providers in a community likely does not even exist. What is more, the federal mandate for universal insurance coverage will not necessarily improve access to health care in rural South Dakota. It is access, not cost (as in urban centers), that is the primary concern among rural populations.<sup>2,10</sup> With current systems so tenuous in place, these areas will require special support and nurturing in order for health care services to survive.

For rural underserved areas the answer is to define network development among communities; that is to say, the answer is cooperation, not competition. Networking involves the partnership of both smaller and larger centers, allowing services to be shared among medical groups that, formerly, may have competed against one another. Rural health networks will need to affiliate with existing geographic health care centers and providers to allow for access to a wider array of services, technical assistance and other resources. As the state anticipates what will emerge on the national level, it has already begun to explore its role in reform,

namely, how to incorporate networking into the health care delivery system.

To address health access concerns, the South Dakota Office of Rural Health (ORH), through developmental funding provided by the Robert Wood Johnson Foundation Practice Sights Initiative (RWJ/PSI), is developing a Regional Coordinated Care Networks (RCCN) program. An Inter-Agency Work Group (IAWG) and three subgroups have been formed to develop and implement interventions discussed later in this paper. All have met, and the subgroups are meeting, on a regular basis. Once a networking plan is completed, communities will be apprised of the opportunity to consider development of a RCCN in their geographic area of the state. Voluntary pilot RCCNs may well herald the beginning of this venture.

The Practice Sights initiative will expand primary, emergency and preventive care and, hopefully, will permanently reduce the number of Health Professional Shortage Areas (HPSAs) in the state by linking and enhancing providers and services. Recruitment and retention of providers will be key to building and sustaining effective networks. Ironically, as the number of practicing physicians in the state has grown over the past decade, so has the number of HPSAs increased (currently 45). This represents more than two-thirds of the state's land mass and nearly one-third of its population.<sup>10</sup> These populations cannot be ignored for they are more impoverished and include more minorities, mainly Native Americans and elderly citizens, than the rest of the state. The much greater infant mortality rate in these HPSAs is itself testimony to the fact that these areas are at risk.<sup>10</sup> To improve the delivery of primary health care services in these areas, networking will be key.

The Office of Rural Health has proposed three interventions to support primary care networks. The first is to create linkages through RCCNs. Linkage will demand communization and inter-community coordination. Underlying this RCCN system is the philosophy that health care is indeed a local concern. The goal is to promote the development of networks in which larger, more regional sites offering a wider array of services work with smaller, local primary sites offering primary, emergency and preventive care services.

In creating logical networks, many factors must be considered. Establishing a data base and enabling community and provider profiles to be evaluated, will facilitate the process of creating RCCNs. Significant distances separate many of the smaller towns, and there is a limit to how far ambulatory providers can travel before compromising the ability to provide acute care. Communities closer in proximity, characteristically proud and resilient, may balk at the notion of cooperation. But for rural South Dakotans who want better access to health care, there is no alternative to networking. An important additional consideration in making this system work is the utilization of midlevel providers; their role in enhancing the provision of primary health care will continue to be significant. South Dakota cur-

rently has 51 Medicare-certified Rural Health Clinics (RHCs) and Federally Qualified Health Centers (FQHCs) which utilize midlevel professionals.<sup>10</sup>

Once rural network systems are in place, the question will become one of recruitment and retention of providers. The **second** intervention calls for change in the financial system now in place in order to enhance the reimbursement and reduce the disincentives for practicing in rural areas of the state. Impending reform will create the need for an additional 20,000 primary care givers to serve in underserved areas.<sup>11</sup> A major goal of the Robert Wood Johnson Practice Sights Initiative (RWJ/PSI) is to recruit family physicians into underserved areas, utilizing such enticements as tuition waiver (Medical Student Scholarship) and reimbursement (Physician Tuition Reimbursement) programs.

It is hoped that the creation of networks will itself attract providers, as the responsibilities for health care will be shared and the incidence of physician burnout hopefully decreased.<sup>2,9</sup> Networking, by increasing the pool of physicians from which to draw upon, will permit more personal time for lifestyle needs and continuing medical education, both important factors in retaining physicians. In addition, effort is being directed towards the further development of medical student and family practice resident experiences (required student clerkships, required resident rural rotations, and rural training tracks [RTTs]) that bring health professional trainees into needy areas.<sup>5,10</sup> Education and training will therefore become important components in making the RCCN system work.

Finally, a loan fund must be established so that primary care practices within the RCCN become more viable; this is the objective of the **third** intervention. Support will be required to start up network systems, equip and renovate health care facilities and to repay loans of recruited providers.<sup>2,10</sup> Such policy changes will make access to capital easier for the newly developing networks.

## SUMMARY

These strategies can thus provide the tools with which to create, develop and sustain viable longterm networks. David Vogel has written, "successful managed care revolves around an interdependence between the managed care organization and its primary care providers".<sup>9</sup> If reform is to be successful, the relationship between the health care delivery system and those who make it work must be symbiotic. Emphasis must be on primary and preventive care, supported by emergency services, which will be made more accessible by managed cooperation through the development of RCCNs. Finally, as the type of primary care services espoused by managed care is congruent with the operative philosophy of family practice, family physicians will logically need to be at the forefront of reform.

## ACKNOWLEDGMENT

The authors appreciate the support of the South Dakota Academy of Family Physicians, South Dakota Foundation of Family Medicine and the South Dakota Office of Rural Health in development of this paper, and acknowledge the developmental funding to the Office of Rural Health by the Robert Wood Johnson Foundation for the Regional Coordinated Care Network program.

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**Patti Herlihy, President, South Dakota  
State Medical Association Alliance**

Perhaps the greatest privilege of my job as SDSMAA President is having the opportunity to visit the districts throughout South Dakota. This week, I made my first guest appearance in Mitchell at Sixth District's general meeting. It was very encouraging to meet the many new and old (meaning I already knew them!) alliance members present. What an enthusiastic, heart-warming group!

Under the inspiring leadership of past-president Susan Tjarks, the Sixth District reorganized itself in 1991—an outstanding accomplishment in these times! At every appropriate opportunity, the AMAA has highlighted their achievement, hopefully convincing other inactive counties and/or districts that they can do it, too! Not only did Sixth District emerge with an astonishing membership of almost 30 (close to 100% participation), they dug in and began contributing to their community.

Family life and children's education being of prime importance, Sixth District members chose health projects geared toward these interests during this past year. A couple of successful garage sales gave the Sixth District enough money to sponsor five scholarships for area children to attend a week-long Science/Environmental Camp at SDSU in Brookings. The Medical Society also joined in providing the necessary funds. Hearing the memories of these garage sales left me with the feeling of a strong sense of comradery among these

alliance members. (The Medical Society was meeting in an adjoining room; they must have wondered about our meeting, as the talk became quite animated at times!) Sixth District also sponsored "Invent America," another education science project for elementary-aged children in Mitchell. Even as they were re-discovering auxiliary's role, these auxiliary members made a permanent impact on the children in their community.

The members of the Sixth District Auxiliary were able to demonstrate the spirit, love and support for one another that we all hope to achieve through our auxiliary/alliance associations. One of their members faced a most difficult situation when her husband, a Mitchell physician, was involved in an unwarranted malpractice trial. Every day auxiliary members showed up in force at the courthouse and sat alongside their fellow auxilian the entire time court was in session. Their concern went far beyond the courtroom: meals were brought to the home; their children were sent cards and treats from other auxilian's children while literally being taken care of during the trial. Empty spaces were filled as the medical community united to help in every possible way. Their support could not have been more complete. The doctor and hospital were both rightfully acquitted.

The undefinable bond which invisibly connects us could not be more apparent than in this situation. As we unite and work for the betterment of health care for all South Dakotans, we also become single-minded in our efforts. However, whenever a personal tragedy affects one of us, we pull together with the love and care that keeps us working with such strong commitment in the first place. I was deeply touched by this alliance's response, but not surprised, as this type of support is the backbone of our organization. We do need one another; Mitchell is living proof.



## *This Is Your Medical Association*

**Dr J. G. Slingsby**, from Rapid City, was named by the American Academy of Ophthalmology to the State Governmental Affairs Committee of the two-committee State Affairs Secretariat. The Secretariat, made up of fourteen doctors from around the nation, is a primary link between the Academy and state ophthalmology societies.

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**Carroll Isburg, MD**, Yankton Medical Clinic pediatrician, is the recipient of the 1993 USD School of Medicine's Faculty Recognition Award for Outstanding Contributions to Medical Education. Dr Isburg has practiced at the clinic for 18 years and has been a clinical assistant professor at USD School of Medicine since 1976.

\*\*\*\*\*

Long-time Wessington Springs physician, **Dr Roscoe E. Dean** was inducted into the South Dakota Hall of Fame. A rural health care reform pioneer, Dr Dean began his practice in Wessington Springs in 1945 and retired in 1990. He was selected for the honor because of his many contributions to the welfare and economy of our state. He has served on many planning and building committees dealing with medical care and was a founding member of the National Academy of Family Practice. During Governor Frank Farrar's administration, he served as coordinator for all rural health care in the state. The State Comprehensive Health Planning Committee, with Dr Dean as chairman set up the present ambulance system manned by certified emergency medical technicians. Prior to that time

**Dr Curtis H. Wait**, 53, of Brookings, died August 5, 1993, at Brookings. He was born April 29, 1940, in Chamberlain where he grew up and graduated from high school in 1958. He received a bachelor of arts degree from Augustana College in Sioux Falls in 1962 and a MD degree from Univ of Iowa Medical School in 1966. He married Barbara Lambertson in 1960, in Sioux Falls. Since 1969, he has been a family practice physician at the Brookings Medical Clinic. He was a member of the First United Methodist Church, Rotary Club and the Corvette Club. He was a member of the American Medical Association, the South Dakota State Medical Association and the Third District Medical Society where he served as a counselor.

Survivors include his wife; three sons: David and his wife, Teresa, Little Rock, AR; Erik and his wife, Char, Columbia, MO; and Steven, Brookings; a daughter, Kathy, Brookings; six grandchildren; his father, Harry, Sioux Falls; and two sisters: Mrs. Colin (Jeanne) Conner, Canton; and Mary Beth Blegen, Worthington, MN.

ambulance service over the state was provided by funeral directors. Dr Dean also worked with Sister Vincent Fuller of Presentation Sisters to set up the nurse practitioner program. These are just a few of his many achievements and contributions to health care in South Dakota.

\*\*\*\*\*

**Daniel J. Heinemann, MD**, one of the founding physicians of Canton Family Physicians, was sworn into office as President of South Dakota Academy of Family Physicians at its 24th annual Black Hills Summer Seminar in Rapid City.

Other officers installed at that meeting are: President-Elect, **Martin J. Christensen, MD**, Mitchell; Vice Presidents, **Allen Nord, MD**, Rapid City, **Richard Honke, MD**, Parkston and **Kevin Bjordahl, MD**, Webster; Secretary/Treasurer, **Margaret Benson, MD**, Sioux Falls; Resident Board Members, **Daniel Reiffenberger, MD**, Sioux Falls, and **Julie Bell, MD**, Sioux Falls.

\*\*\*\*\*

**Michael J. Brown, MD**, Spearfish, was named "Family Doctor of the Year" by the South Dakota Academy of Family Physicians. Dr Brown was born in Washington, but he grew up in Britton, South Dakota. He received his medical degree from the University of Texas School of Medicine, San Antonio, in 1970 and completed an internship at Sioux Valley Hospital in Sioux Falls. From 1971-1974, he served at the Air Force Academy in Colorado Springs. He received the Air Force Commendation Medal in 1974.

Dr Brown has been a member of the South Dakota Academy of Family Physicians since 1974, serving on the board of directors from 1981-1988 and as president from 1985-1986. He is a clinical professor of family medicine at the USD School of Medicine, and received the Edward D. Batt Award as outstanding Department of Family Medicine faculty member in 1984-1985. He is South Dakota's senior delegate to the American Academy of Family Physicians Congress of Delegates. He is also co-owner of Queen City Medical Center in Spearfish.

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Yankton Medical Clinic oncologist, **Max L. Farver, MD**, was presented with the American Cancer Society's Leadership Medal by the Society's national office.

Dr Farver served as president of the South Dakota Division of the American Cancer Society from 1990 through 1992. As a past president, he remains active on the state board of directors, and represents Yankton county as medical delegate to the board of directors. Dr Farver has been in practice at the Yankton Medical Clinic for five years.

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**Patty Jarratt Peters, MD**, family practice physician at McGreevy Clinic, Sioux Falls, is the first woman to serve as chief of the McKennan Hospital medical staff. She also serves as a member of the Presentation Health System's Physicians Advisory Council. Dr Peters is a clinical associate professor in the Department of Family Practice at the USD School of Medicine. She received the 1990-1991 Department of Family Practice Edward J. Batt Memorial Award as the outstanding faculty member.

\*\*\*\*\*

Watertown surgeon, **G. Robert Bartron, MD**, was awarded the status of Emeritus Clinical Professor of Surgery by Robert Talley, MD, Dean of USD School of Medicine. Dr Bartron was selected for this honor because of his commitment to the School of Medicine and his commitment to medicine in South Dakota.

Dr Bartron has served as clinical faculty at the USD School of Medicine since the inception of the program in 1948 and has helped train some of the most distinguished physicians in South Dakota. He was deeply involved in the construction of the Andrew Lee Medicine and Science Building in Vermillion and the creation of the four-year medical program.

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**Richard G. Sample, MD**, Interlakes Medical Center of Madison, and a clinical professor of the Department of Family Medicine of the USD School of Medicine, is recipient of the Edward J. Batt, MD Memorial Award for 1992-1993. The award is given to the outstanding department clinical faculty member based on the recommendations of full-time faculty and evaluations of students. Dr Sample has worked with 67 students since 1981 when records were first kept.

Dr Sample received his MD degree from the USD School of Medicine in 1978 and completed his residency training at the Family Practice Center in Sioux Falls in 1981. He is a diplomate of the American Board of Family Practice.

\*\*\*\*\*

Rapid City physician and president of the South Dakota State Medical Association, **Thomas L. Krafka, MD**, has been named as a fellow of the American College of Radiology (ACR) during their annual meeting in Orlando, Florida. He was selected for his outstanding contributions to the field of radiology. Fellowships in the College are awarded to members for significant scientific or clinical research in the field of radiology or significant contributions to its literature. The criteria for selection also include performance of outstanding service as a teacher of radiology, service to organized medicine and an outstanding reputation among colleagues and the local community as a result of long-term superior service.

\*\*\*\*\*

**Michael Davies, MD, FACP**, of Sturgis, has been named a fellow in the American College of Physicians (ACP). Fellowship in ACP is an honorary designation that recognizes scholarly and professional achieve-

ments in internal medicine. Dr Davies, a specialist in internal medicine, is acting chief of staff at Fort Meade. He completed his medical degree and internal medicine residency through the USD School of Medicine at Vermillion. He is board certified by the American Board of Internal Medicine and is a two-year recipient of the Golden Apple Award for teaching excellence through the USD School of Medicine.

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### DEEP, The South Dakota Medicaid Drug Use Review Program. Is The Hassle Justified?

Richard P. Holm, MD and David Helgeland, R.Ph

#### ABSTRACT

Governmentally-mandated programs are a fact of life in health care. Such programs are often considered "hassles" by health care providers, who sometimes question whether such programs can justify themselves. The South Dakota Drug Evaluation and Education Program (DEEP) is a federally-mandated program of drug use review for Medicaid patients. While the program does not mandate changes in therapy, review of the program's first year of data indicates it caused change in 68.1% of the cases resulting in benefits which include a reduction in unnecessary/unneeded medication.

In 1990, the United States Congress passed the Omnibus Budget Reconciliation Act (commonly referred to as "OBRA '90") which mandated that each state review prescription drug therapy for Medicaid patients. One aspect of the drug use review (DUR) program was to be a retrospective review program.

To comply with this mandate, the South Dakota Drug Evaluation and Education Program (DEEP) was established and is functioning. A steering committee composed mainly of physicians and pharmacists sets program policy and a separate but similar evaluation committee sets review parameters and reviews patient profiles.

If a patient's therapy falls outside of parameters, the prescribing clinician (physicians, physician assistants, or nurse practitioners) and the pharmacy provider are notified by letter. The clinician is asked to review the therapy and change it only if appropriate. DEEP does not mandate changes in therapy. Clinicians are asked to send a note back to the program director as to whether a change in therapy will be made and what condition is being treated.

When a particular patient's therapy has fallen outside of parameters, that patient's therapy is reviewed again in six months. If the therapy is still outside of parameters and the clinician does not respond to the previous letter, then s/he is sent another letter. Generally, if the clinician responds to the first letter another is not sent.

As DEEP became operational it was decided that the first category of drugs to review would be H-2 blockers. H-2 blockers were chosen mainly because they were widely prescribed, are expensive, and were an easy category of drugs to set parameters and to program for the initial computer screening.

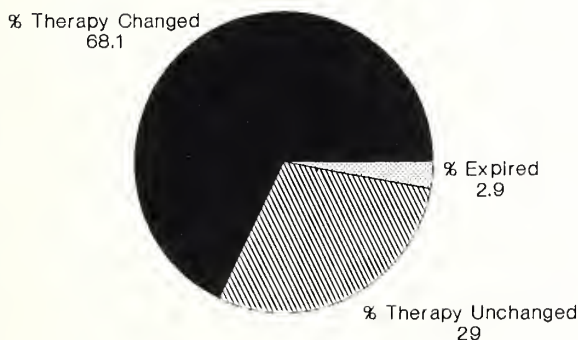
Reviews have now been performed since November 1, 1991. Any therapy which fell outside of parameters during the first 12 months of reviews has been screened again at least once (eg: therapy falling outside of parameters in October of 1992 was screened again in

April of 1993). The following figures are the results of the first 12 months of reviews:

|                       |   |
|-----------------------|---|
| 345 Patients—         | had fallen outside of parameters and letter were sent to the prescribing clinicians   |
| 235 Patients (68.1%)— | upon re-screening therapy does not fall outside of parameters   |
| 45 Patients (13%)—    | the clinician responded by letter to state that the therapy would be changed  |
| 190 Patients (55.1%)— | no response was received but therapy no longer falls outside of parameters (of these patients, a small percentage probably have expired or are no longer Medicaid patients) |
| 100 Patients (29%)—   | therapy remained outside of parameters  |
| 76 Patients (22%)—    | clinicians wrote to say that the therapy must stay the same   |
| 7 Patients—           | (of the 76 patients) therapy had been changed but had to be changed back  |
| 20 Patients (5.8%)—   | clinicians did not respond to letters and no change was made in therapy   |
| 4 Patients (1.2%)—    | clinicians did not respond to letters, but re-screening showed that therapy had been changed but was later changed back to therapy falling outside parameters               |
| 10 Patients (2.9%)—   | clinicians responded that the patient had expired   |

DEEP has used review parameters for the "prevention of the recurrence of duodenal ulcers." Some clinicians are treating other conditions (such as reflux esophagitis) which can or may appropriately require the prolonged use of higher doses of H-2 blockers. At this point, the conditions being treated are recorded but have not been tabulated. With the advent of antimicrobial therapy for dyspeptic disease, these parameters may have to change.

## Review of H-2 Blockers First Year's Results



346 Total Patients

### CONCLUSIONS

With such a high percentage (68.1%) of therapy being changed and staying changed, the South Dakota Drug Evaluation and Education Program is evidently identifying therapy which could be changed without adverse outcomes. Certainly this was not true in all cases. With the changing conditions of patients it is probable that some patients will need to revert to receiving the prior therapy.

There has been some concern shown by Medicaid providers that DEEP does not justify itself. This program is federally mandated without any provision for cost-justification. What's more, if patients are able to do as well with less drugs, and/or if clinicians learn about new "standards of practice", then the program is "justified" without cost savings. However, in looking at the drug cost savings for H-2 blockers one can see the potential cost savings with the program.

The cost savings to the Medicaid program in shifting from full therapeutic dosing to maintenance dosing with H-2 blockers is approximately one dollar per patient per day. When an H-2 blocker is no longer necessary and maintenance therapy is shifted to no drug, the cost savings is over one dollar per patient per day. It would

be tempting to say that having H-2 blocker therapy changed for 235 patients saved the state of South Dakota \$85,775 in Medicaid drug costs in one year. However, other factors must be recognized. Some of the changes in therapy would eventually have been made without DEEP's intervention. Some of the changed therapy may yet need to be changed back to previous levels because of patient need. But, one must also realize by informing practitioners about H-2 therapy in a particular case that the awareness will carry over to other patients — both Medicaid and non-Medicaid patients. Thus, there would be hidden savings to the state or to other patients or their third-party carriers.

We understand that such review programs may add to the "hassle" of medical practice in today's world. Our justification is that:

1. We have tried to make this federally mandated program as much of an educational experience and as little of a hassle as possible.
2. It has/will save money.
3. It has/will prepare for the "managed care" of the future.
4. It has/will reduce the use of unnecessary/unneeded medication.

It is our sincerest hope that clinicians will realize the benefits of this program and view it not with angst but acceptance.

### AUTHORS

Richard P. Holm, MD, a member of the DEEP Steering Committee, is a practicing internist from Brookings, SD.

David Helgeland, R.Ph, is the director of DEEP and Assistant Professor of Pharmaceutical Sciences at the SDSU College of Pharmacy in Brookings, SD.

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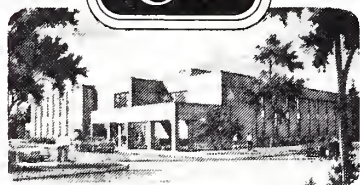
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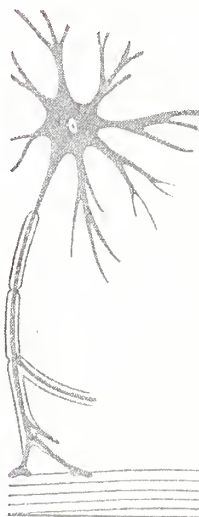


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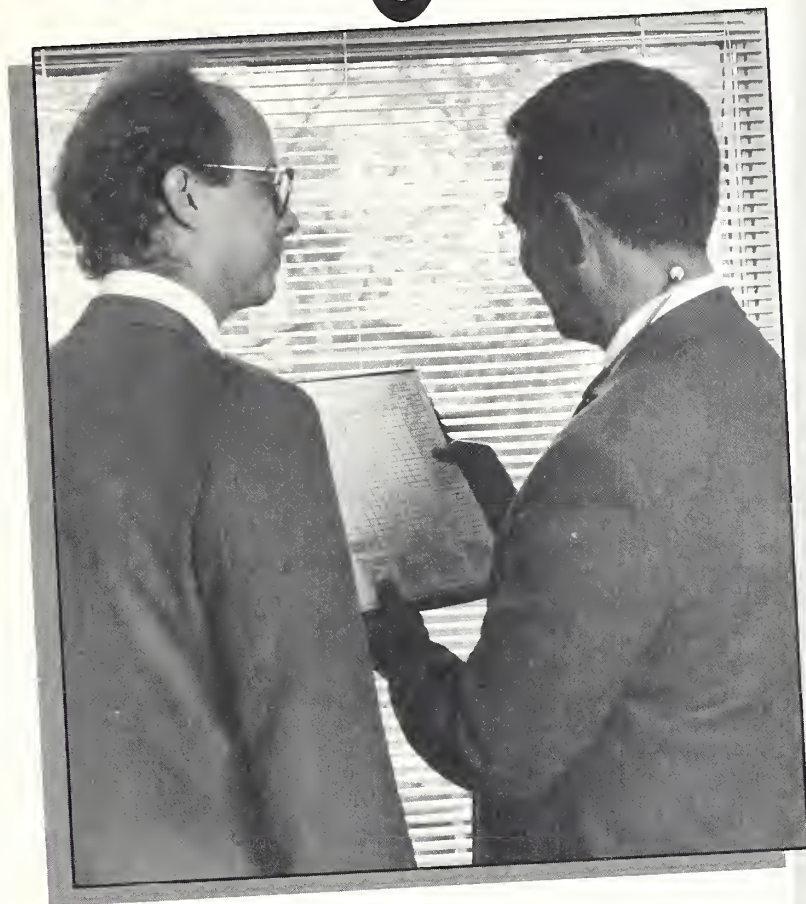
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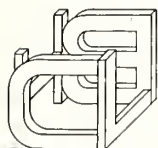
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## What Their Caregivers Don't Know May Hurt Them

Jane R. Mort, Pharm.D., Brookings, SD

The majority of the two million Americans affected by dementia stay in their homes until the latter stages of their illness.<sup>1</sup> In spite of the documented benefits of staying at home,<sup>2</sup> management of dementia patients in this setting poses some unique problems. Disruptive behaviors accompanying dementia place significant strain on the untrained caregiver and can be a danger to the person with the dementing illness.<sup>3</sup> Medications which are prescribed to help alleviate problems may be misunderstood, misused and the side effects may go unnoticed.<sup>4</sup> The literature and regulations such as OBRA 87 have focused their attention on medication use in long term care (LTC) facilities. Trained professionals are available at all times in LTC facilities to assess problems and monitor therapy. Community based caregivers are often presented with the same problems but lack training in this area. The knowledge and practices of community caregivers of patients with dementia were recently addressed in a study of this issue.<sup>4</sup>

Psychotropic agents play an important role in managing demented patients in the community. Results of a study surveying caregivers of patients with dementia in the community showed 18 (78.3%) of the care recipients were administered psychotropic agents.<sup>4</sup> Other research has shown that psychotropic agents are prescribed to a lower percentage of patients with dementia in LTC facilities<sup>5</sup> and a much lower percentage of all residents in LTC facilities and rest homes<sup>6-9</sup> compared to the community sample.<sup>4</sup> Perhaps psychotropic agents are used more in the community because of the absence of supportive personnel or the lack of training in nonpharmacologic management. The types of psychotropic agents utilized in the community also differed from long term care reports. Of the psychotropic agents given, the community sample<sup>4</sup> used a higher percentage of antidepressants (28% versus 14%) and a lower percentage of antipsychotic agents (28% versus 45%) compared to other research.<sup>7</sup> This may be due to the less advanced stage of the community care recipient compared to those with dementia in LTC facilities. Earlier stages of dementia are more often accompanied by depression<sup>10</sup> while the later stages may include behaviors which are more severe and require antipsychotic agents.<sup>11,12</sup>

In order for the health care provider to best assess psychotropic therapy the caregiver must understand the reason for administering the agent. The study of community caregivers described some important misperceptions.<sup>4</sup> Several caregivers believed

psychotropic agents would improve memory. Multiple caregivers stated they were giving an antipsychotic agent for such things as anxiety, being demanding/stubborn, and manipulative behavior. Current practice standards clearly do not include these problems as appropriate reasons for administration of antipsychotic agents.<sup>13</sup> Community caregivers' misperceptions were further illustrated in their evaluation of psychotropic agents utility. Approximately one third of the caregivers felt psychotropic agents were appropriate for irritability and hyperactivity while only 4.5% to 9% identified psychotropic agents as being appropriate for aggression to others or property, self-injury, delusions/hallucinations, and depression.<sup>4</sup> The latter are well accepted reasons for administering psychotropic agents.<sup>11,13,14</sup> It should be pointed out that agitation, depression, delusions, hallucinations, and paranoia were frequently reported as problems by the caregivers studied.<sup>4</sup> This information indicates that the caregivers have a distorted perception of the situations which constitute an appropriate reason for administering a psychotropic medication. This becomes even more important when compliance patterns are considered. The majority (84%) of the psychotropic agents were scheduled but caregivers adjusted therapy on their own for 32% of the agents. This unsupervised alteration is not surprising given the caregivers identification of inappropriate target behaviors.<sup>4</sup>

Caregivers must be able to identify side effects in order to report them to their physician in a timely manner for proper adjustment of therapy. Many of the community caregivers sampled were unable to identify sedation, behavioral excitability, dizziness and falls, changes in attention span, dry mouth, movement disorders, and blurred vision as potential problems associated with psychotropic agents. In addition, four bogus side effects (hair loss, joint pain, kidney stones, and gout) were included and 21.5% to 39% of the caregivers identified these as possible side effects of the medications. Caregivers were also asked to identify side effects their care recipient had experienced. Twelve separate side effects were reportedly caused by 24 drugs. This information indicates that the caregivers were able to astutely identify many problems resulting from the medications but they were often unaware of important side effects and occasionally unable to separate out unrelated problems.<sup>4</sup>

The source of the community caregiver's medication information was also examined. The most commonly reported providers were physicians, followed by nurses and then pharmacists. Of the information provided by physicians, one third was conveyed over the phone. This would suggest that in these cases the caregivers were dealing with an unexpected problem which required prompt attention.<sup>4</sup>



Caregivers of demented patients in the community are confronted daily with complex problems and psychotropic agents are a viable management option when used appropriately.<sup>12</sup> Caregiver education is necessary to optimize the therapeutic benefit. Without proper education caregivers have been found to have many misperceptions regarding the endpoints of psychotropic therapy and often lack the ability to discern resultant side effects.<sup>4</sup> If emphasis is placed on targeting specific behaviors for therapy and the identifying of side effects, fear regarding the use and side effects of these drugs will be minimized. The study of community caregivers found physicians were the most utilized health care professional for medication information, thus physicians have a tremendous potential for improving the care of demented patients in the community.

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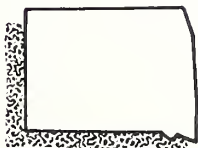
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Volume 46/No. 11 November 1993

(ISSN 0038-3317)

Official Publication of the  
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of the American Psychiatric Association

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### About the Cover

*The new South Dakota Health Sciences Library, is not a traditional library but the center of a dramatically enriched information network. For more information, see pages 399-402.*



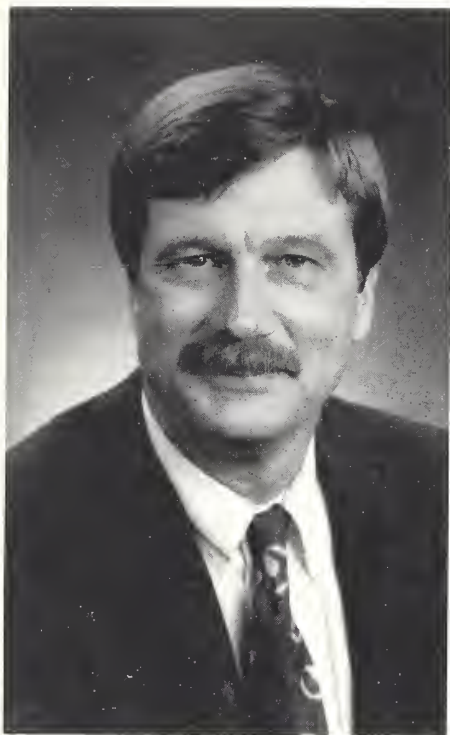
# South Dakota Foundation for Medical Care

## Health Care Quality Improvement Initiative

The South Dakota Foundation for Medical Care (SDFMC) has visited several Hospitals/Quality Improvement committees this past month; we would like to visit many more. Along with information from chart review, we can now analyze patterns of healthcare and patient outcomes and share information with providers on how together SDFMC and providers may meet the challenge of improving patient care.

Our database can provide us with project ideas, but we need you to help us look at the information in a knowledgeable, beneficial way (to you, the patient and us). Please contact me or my assistant, Stacy Bloemendaal, RN, at 336-3505 with any questions or ideas for data searches.

Bruce Lushbough, MD, MS  
Principal Clinical Coordinator  
South Dakota Foundation For Medical Care  
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**Thomas L. Krafska, MD, President  
South Dakota State Medical Association**

### The Clinton Plan!

Anyone expecting an analysis of "The Plan" will be disappointed. Reading the plan (I did) was anticlimatic since most of it had been leaked, trial ballooned, or otherwise anticipated. Reading it may have also been wasted time since there were reported to have been 700 changes in the first week after its unveiling.

The revised plan should be released to Congress soon and it will be time for all of us to get involved in the debate. An effective way to learn is to get a good analysis of the plan (from the AMA, your specialty society, etc). When you have good information talk to your friends, your patients and your Congressman about what you like and don't like.

It's no secret that I favor reform (not the Clinton Plan) and am willing to support it as long as we can be involved and because we are uniquely positioned to deal with the reform in South Dakota. I have recently heard enough of our members question the need for any reform that I am starting to feel like a new second lieutenant in Vietnam. Since I need to represent our

membership, it's important I know what the membership wants. Let me know—talk to your councilors, officers, Bob or me.

Keep smiling and send me your Bill and Hillary jokes.

*Thomas L. Krafska MD*

P.S. By the time you read this you should have received a survey from Dr. Rietz. Please take the time to fill it out and return it. Thanks.





To you and the staff  
at your clinic, our  
best wishes for a  
Happy Thanksgiving.

# South Dakota Blue Shield



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### Psychological Aspects of Ethical Decision Making

While much has been written about ethical dilemmas in medicine, there has been relatively little focus on the psychologic aspects of these issues. Indeed, with the development and emphasis of ethical principles in decision making, there has been an explicit attempt made to place ethical analysis above personal whims, beliefs, and emotions and to make it a more objective process.

Ethical principles can point the way to a consistent approach to dilemmas in a diverse and pluralistic society. Nevertheless, it is imperative to clearly recognize and specifically address the variety of emotional difficulties which can attend the ethical problems we see in medicine. These difficulties can easily affect all parties in the health care arena. The physician, nurse, patient, family and other members of the health care team are frequently impacted. Medical and nursing students are other groups with a vital stake in this process. Oftentimes decisions which seem reasonable and even straightforward to an experienced practitioner, can be very disturbing and confusing to the inexperienced student.

As a reflection of the significant role which emotional factors play in ethical decision making, it is frequently observed that many of the issues brought to institutional ethics committees prove to be based as much on emotional difficulties as on true ethical quandaries. In the face of severe illness or impending death, it is very common for long-standing antagonisms and disagreements in families to rise to prominence. Inadequate communication and misunderstanding can also complicate decision making. For instance, a family who equates a do-not-resuscitate order with a "no care" order might easily balk at approving a "no CPR" status. If patients and families do not understand that proposed treatments frequently represent a balance between benefit and burden, it can be very difficult for them to accept a decision not to use heroic, and likely futile, measures. The very uncertainty and ambiguity that necessarily accompanies value judgments can be very distressing and confusing to the parties involved. Even when a sound ethical judgment is made (for instance, discontinuing tube feedings in an individual in a permanent vegetative state and with an advance directive), it can be distressing. I remember conducting a past seminar in which medical and nursing students were discussing the discontinuing of the feeding tube in the Nancy Cruzan case. On several occasions, I found myself asking the students, "are you comfortable with stopping the feedings?" It then occurred to me how unsatisfactory the word "comfortable" is in such a set-

ting. Even if the parties involved agree that ceasing tube feedings is ethically and medically appropriate, much ambivalence and discomfiture with this difficult decision may well remain.

When it comes to difficult value and ethical decisions, we must continually be mindful to be gentle with ourselves, our patients, and our students. We must be attentive to the depth and complexity of ethical issues and realize the emotional toll they can exact. A willingness to recognize and discuss these factors can go a long way toward ameliorating their potential for pain and helping all of us cope with them. This can be difficult work, but it is often an integral part of what we do as physicians.

Jerome W. Freeman, MD  
Editor

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**VASERETIC® 10-25**  
Enalapril Maleate-Hydrochlorothiazide

*Next*

Dosage must be individualized; the fixed combination is not for initial therapy. Evaluation of the hypertensive patient should always include assessment of renal function. For a Brief Summary of Prescribing Information, see adjacent pages.



**TABULETS  
VASERETIC®  
(ENALAPRIL MALEATE-HYDROCHLOROTHIAZIDE)**

**USE IN PREGNANCY:** When used in pregnancy during the second and third trimesters, ACE inhibitors can cause injury and even death to the developing fetus. When pregnancy is detected, VASERETIC (Enalapril Maleate-Hydrochlorothiazide) should be discontinued as soon as possible. See WARNINGS, Fetal/Neonatal Morbidity and Mortality.

**CONTRAINDICATIONS:** VASERETIC is contraindicated in patients who are hypersensitive to any component of this product and in patients with a history of angioedema related to previous treatment with an angiotensin converting enzyme inhibitor. Because of the hydrochlorothiazide component, this product is contraindicated in patients with anuria or hypersensitivity to other sulfonamide-derived drugs.

**WARNINGS:** General: Enalapril Maleate, Hypotension: Excessive hypotension was rarely seen in uncomplicated hypertensive patients but is a possible consequence of enalapril use in severely salt/volume depleted persons such as those treated vigorously with diuretics or patients on dialysis.

Syncope has been reported in 1.3 percent of patients receiving VASERETIC. In patients receiving enalapril alone, the incidence of syncope is 0.5 percent. The overall incidence of syncope may be reduced by proper titration of the individual components. (See PRECAUTIONS, Drug Interactions, and ADVERSE REACTIONS.)

In patients with severe congestive heart failure, with or without associated renal insufficiency, excessive hypotension has been observed and may be associated with oliguria and/or progressive azotemia, and rarely with acute renal failure and/or death. Because of the potential fall in blood pressure in these patients, therapy should be started under very close medical supervision. Such patients should be followed closely for the first two weeks of treatment and whenever the dose of enalapril and/or diuretic is increased. Similar considerations may apply to patients with ischemic heart or cerebrovascular disease, in whom an excessive fall in blood pressure could result in a myocardial infarction or cerebrovascular accident.

If hypotension occurs, the patient should be placed in the supine position and, if necessary, receive an intravenous infusion of normal saline. A transient hypotensive response is not a contraindication to further doses, which usually can be given without difficulty once the blood pressure has increased after volume expansion.

**Angioedema:** Angioedema of the face, extremities, lips, tongue, glottis and/or larynx has been reported in patients treated with angiotensin converting enzyme inhibitors, including enalapril. In such cases VASERETIC should be promptly discontinued and appropriate therapy and monitoring should be provided until complete and sustained resolution of signs and symptoms has occurred. In instances where swelling has been confined to the face and lips the condition has generally resolved without treatment, although antihistamines have been used in relieving symptoms. Angioedema associated with laryngeal edema may be fatal. Where there is involvement of the tongue, glottis or larynx, likely to cause airway obstruction, appropriate therapy, e.g., subcutaneous epinephrine solution 1:1000 (0.3 mL to 0.5 mL) and/or measures necessary to ensure a patent airway, should be promptly provided. (See ADVERSE REACTIONS.)

Patients with a history of angioedema unrelated to ACE inhibitor therapy may be at increased risk of angioedema while receiving an ACE inhibitor (see also CONTRAINDICATIONS).

**Neutropenia/Aggranulocytosis:** Another angiotensin converting enzyme inhibitor, captopril, has been shown to cause agranulocytosis and bone marrow depression, rarely in uncomplicated patients but more frequently in patients with renal impairment especially if they also have a collagen vascular disease. Available data from clinical trials of enalapril are insufficient to show that enalapril does not cause agranulocytosis at similar rates. Marketing experience has revealed several cases of neutropenia or agranulocytosis in which a causal relationship to enalapril cannot be excluded. Periodic monitoring of white blood cell counts in patients with collagen vascular disease and renal disease should be considered.

**Hydrochlorothiazide:** Thiazides should be used with caution in severe renal disease. In patients with renal disease, thiazides may precipitate azotemia. Cumulative effects of the drug may develop in patients with impaired renal function.

Thiazides should be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma.

Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma.

The possibility of exacerbation or activation of systemic lupus erythematosus has been reported.

Lithium generally should not be given with thiazides (see PRECAUTIONS, Drug Interactions, Enalapril Maleate and Hydrochlorothiazide).

**Pregnancy:** Enalapril-Hydrochlorothiazide: There was no teratogenicity in rats given up to 90 mg/kg/day of enalapril (150 times the maximum human dose) in combination with 10 mg/kg/day of hydrochlorothiazide (2 1/2 times the maximum human dose) or in mice given up to 30 mg/kg/day of enalapril (50 times the maximum human dose) in combination with 10 mg/kg/day of hydrochlorothiazide (2 1/2 times the maximum human dose). At these doses, fetotoxicity expressed as a decrease in average fetal weight occurred in both species. No fetotoxicity occurred at lower doses; 30/10 mg/kg/day of enalapril-hydrochlorothiazide in rats and 10/10 mg/kg/day of enalapril-hydrochlorothiazide in mice.

When used in pregnancy during the second and third trimesters, ACE inhibitors can cause injury and even death to the developing fetus. When pregnancy is detected, VASERETIC should be discontinued as soon as possible. (See Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality, below.) Enalapril Maleate, Fetal/Neonatal Morbidity and Mortality: ACE inhibitors can cause fetal and neonatal morbidity and death when administered to pregnant women. Several dozen cases have been reported in the world literature. When pregnancy is detected, ACE inhibitors should be discontinued as soon as possible.

The use of ACE inhibitors during the second and third trimesters of pregnancy has been associated with fetal and neonatal injury, including hypotension, neonatal skull hypoplasia, anuria, reversible or irreversible renal failure, and death. Oligohydramnios has also been reported, presumably resulting from decreased fetal renal function; oligohydramnios in this setting has been associated with fetal limb contractures, craniofacial deformation, and hypoplastic lung development. Prematurity, intrauterine growth retardation, and patent ductus arteriosus have also been reported, although it is not clear whether these occurrences were due to the ACE-inhibitor exposure.

These adverse effects do not appear to have resulted from intrauterine ACE-inhibitor exposure that has been limited to the first trimester. Mothers whose embryos and fetuses are exposed to ACE inhibitors only during the first trimester should be so informed. Nonetheless, when patients become pregnant, physicians should make every effort to discontinue the use of VASERETIC as soon as possible.

Rarely (probably less often than once in every thousand pregnancies), no

alternative to ACE inhibitors will be found. In these rare cases, the mothers should be apprised of the potential hazards to their fetuses, and serial ultrasound examinations should be performed to assess the intraamniotic environment.

If oligohydramnios is observed, VASERETIC should be discontinued unless it is considered lifesaving for the mother. Contractions stress testing (CST), a non-stress test (NST), or biophysical profiling (BPP) may be appropriate, depending upon the week of pregnancy. Patients and physicians should be aware, however, that oligohydramnios may not appear until after the fetus has sustained irreversible injury.

Infants with histories of *in utero* exposure to ACE inhibitors should be closely observed for hypotension, oliguria, and hyperkalemia. If oliguria occurs, attention should be directed toward support of blood pressure and renal perfusion. Exchange transfusion or dialysis may be required as means of reversing hypotension and/or substituting for disordered renal function. Enalapril, which crosses the placenta, has been removed from neonatal circulation by peritoneal dialysis with some clinical benefit, and theoretically may be removed by exchange transfusion, although there is no experience with the latter procedure.

No teratogenic effects of enalapril were seen in studies of pregnant rats, and rabbits. On a mg/kg basis, the doses used were up to 333 times (in rats), and 50 times (in rabbits) the maximum recommended human dose.

**Hydrochlorothiazide, Teratogenic Effects:** Reproduction studies in the rabbit, the mouse and the rat at doses up to 100 mg/kg/day (50 times the human dose) showed no evidence of external abnormalities of the fetus due to hydrochlorothiazide. Hydrochlorothiazide given in a two-liter study in rats at doses of 4-5.6 mg/kg/day (approximately 1-2 times the usual daily human dose) did not impair fertility or produce birth abnormalities in the offspring. Thiazides cross the placental barrier and appear in cord blood.

**Nonteratogenic Effects:** These may include fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions which have occurred in the adult.

**PRECAUTIONS:** General: Enalapril Maleate, Impaired Renal Function: As a consequence of inhibiting the renin-angiotensin-aldosterone system, changes in renal function may be anticipated in susceptible individuals. In patients with severe congestive heart failure whose renal function may depend on the activity of the renin-angiotensin-aldosterone system, treatment with angiotensin converting enzyme inhibitors, including enalapril, may be associated with oliguria and/or progressive azotemia and rarely with acute renal failure and/or death.

In clinical studies in hypertensive patients with unilateral or bilateral renal artery stenosis, increases in blood urea nitrogen and serum creatinine were observed in 20 percent of patients. These increases were almost always reversible upon discontinuation of enalapril and/or diuretic therapy. In such patients renal function should be monitored during the first few weeks of therapy.

Some patients with hypertension or heart failure with no apparent pre-existing renal vascular disease have developed increases in blood urea and serum creatinine, usually minor and transient, especially when enalapril has been given concomitantly with a diuretic. This is more likely to occur in patients with pre-existing renal impairment. Dosage reduction of enalapril and/or discontinuation of the diuretic may be required.

**Evaluation of the hypertensive patient should always include assessment of renal function.**

**Hemodialysis Patients:** Anaphylactoid reactions have been reported in patients dialyzed with high-flux membranes (e.g., AN 69) and treated concomitantly with an ACE inhibitor. In these patients consideration should be given to using a different type of dialysis membrane or a different class of antihypertensive agent.

**Hyperkalemia:** Elevated serum potassium (greater than 5.7 mEq/L) was observed in approximately one percent of hypertensive patients in clinical trials treated with enalapril alone. In most cases these were isolated values which resolved despite continued therapy, although hyperkalemia was a cause of discontinuation of therapy in 0.28 percent of hypertensive patients. Hyperkalemia was less frequent (approximately 0.1 percent) in patients treated with enalapril plus hydrochlorothiazide. Risk factors for the development of hyperkalemia include renal insufficiency, diabetes mellitus, and the concomitant use of potassium-sparing diuretics, potassium supplements and/or potassium-containing salt substitutes, which should be used cautiously, if at all, with enalapril. (See Drug Interactions.)

**Cough:** Cough has been reported with the use of ACE inhibitors. Characteristically, the cough is nonproductive, persistent and resolves after discontinuation of therapy. ACE inhibitor-induced cough should be considered as part of the differential diagnosis of cough.

**Surgery/Anesthesia:** In patients undergoing major surgery or during anesthesia with agents that produce hypotension, enalapril may block angiotensin II formation secondary to compensatory renin release. If hypotension occurs and is considered to be due to this mechanism, it can be corrected by volume expansion.

**Hydrochlorothiazide:** Periodic determination of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals. All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance: hyponatremia, hypochloremic alkalosis, and hypokalemia. Serum and urine electrolyte determinations are particularly important when the patient is vomiting excessively or receiving parenteral fluid. Warning signs or symptoms of fluid and electrolyte imbalance, irrespective of cause, include dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, confusion, seizures, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting.

Hyperkalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or after prolonged therapy. Interference with adequate oral electrolyte intake will also contribute to hypokalemia. Hypokalemia may cause cardiac arrhythmia and may also sensitize or exaggerate the response of the heart to the toxic effects of digitalis (e.g., increased ventricular irritability). Because enalapril reduces the production of aldosterone, concomitant therapy with enalapril attenuates the diuretic-induced potassium loss (see Drug Interactions, Agents Increasing Serum Potassium).

Although any chloride deficit is generally mild and usually does not require specific treatment except under extraordinary circumstances (as in liver disease or renal disease), chloride replacement may be required in the

treatment of metabolic alkalosis. Dilutional hyponatremia may occur in edematous patients in hot weather; appropriate therapy is water restriction, rather than administration of salt except in rare instances when the hyponatremia is life-threatening. In actual salt depletion, appropriate replacement is the therapy of choice.

Hyperuricemia may occur or frank gout may be precipitated in certain patients receiving thiazide therapy.

In diabetic patients dosage adjustments of insulin or oral hypoglycemic agents may be required. Hyperglycemia may occur with thiazide diuretics. Thus latent diabetes mellitus may become manifest during thiazide therapy.

The antihypertensive effects of the drug may be enhanced in the postsympathotomy patient.

If progressive renal impairment becomes evident consider withholding or discontinuing diuretic therapy.

Thiazides have been shown to increase the urinary excretion of magnesium; this may result in hypomagnesemia.

Thiazides may decrease urinary calcium excretion. Thiazides may cause intermittent and slight elevation of serum calcium in the absence of known disorders of calcium metabolism. Marked hypercalcemia may be evidence of hidden hyperparathyroidism. Thiazides should be discontinued before carrying out tests for parathyroid function.

Increases in cholesterol and triglyceride levels may be associated with thiazide diuretic therapy.

**Information for Patients: Angioedema:** Angioedema, including laryngeal edema, may occur especially following the first dose of enalapril. Patients should be so advised and told to report immediately any signs or symptoms suggesting angioedema (swelling of face, extremities, eyes, lips, tongue, difficulty in swallowing or breathing) and to take no more drug until they have consulted with the prescribing physician.

**Hypotension:** Patients should be cautioned to report lightheadedness especially during the first few days of therapy. If actual syncope occurs, the patients should be told to discontinue the drug until they have consulted with the prescribing physician.

All patients should be cautioned that excessive perspiration and dehydration may lead to an excessive fall in blood pressure because of reduction in fluid volume. Other causes of volume depletion such as vomiting or diarrhea may also lead to a fall in blood pressure; patients should be advised to consult with the physician.

**Hyperkalemia:** Patients should be told not to use salt substitutes containing potassium without consulting their physician.

**Neutropenia:** Patients should be told to report promptly any indication of infection (e.g., sore throat, fever) which may be a sign of neutropenia.

**Pregnancy:** Female patients of childbearing age should be told about the consequences of second- and third-trimester exposure to ACE inhibitors, and they should also be told that these consequences do not appear to have resulted from intrauterine ACE-inhibitor exposure that has been limited to the first trimester. These patients should be asked to report pregnancies to their physicians as soon as possible.

**NOTE:** As with many other drugs, certain advice to patients being treated with VASERETIC is warranted. This information is intended to aid in the safe and effective use of this medication. It is not a disclosure of all possible adverse or intended effects.

**Drug Interactions: Enalapril Maleate, Hypotension—Patients on Diuretic Therapy:** Patients on diuretics and especially those in whom diuretic therapy was recently instituted, may occasionally experience an excessive reduction of blood pressure after initiation of therapy with enalapril. The possibility of hypotensive effects with enalapril can be minimized by either discontinuing the diuretic or increasing the salt intake prior to initiation of treatment with enalapril. If it is necessary to continue the diuretic, provide medical supervision for at least two hours and until blood pressure has stabilized for at least an additional hour. (See WARNINGS.)

**Agents Causing Renin Release:** The antihypertensive effect of enalapril is augmented by antihypertensive agents that cause renin release (e.g., diuretics).

**Other Cardiovascular Agents:** Enalapril has been used concomitantly with beta adrenergic-blocking agents, methylglucosides, nitrates, calcium-blocking agents, hydralazine and prazosin without evidence of clinically significant adverse interactions.

**Agents Increasing Serum Potassium:** Enalapril attenuates diuretic-induced potassium loss. Potassium-sparing diuretics (e.g., spironolactone, triamterene, or amiloride), potassium supplements, or potassium-containing salt substitutes may lead to significant increases in serum potassium. Therefore, if concomitant use of these agents is indicated because of demonstrated hypokalemia they should be used with caution and with frequent monitoring of serum potassium.

**Lithium:** Lithium toxicity has been reported in patients receiving lithium concomitantly with drugs which cause elimination of sodium, including ACE inhibitors. A few cases of lithium toxicity have been reported in patients receiving concomitant enalapril and lithium and were reversible upon discontinuation of both drugs. It is recommended that serum lithium levels be monitored frequently if enalapril is administered concomitantly with lithium. Hydrochlorothiazide: When administered concurrently the following drugs may interact with thiazide diuretics:

Alcohol, barbiturates, or narcotics—potentiation of orthostatic hypotension may occur.

Antidiabetic drugs (oral agents and insulin)—dosage adjustment of the antidiabetic drug may be required.

Other antihypertensive drugs—additive effect or potentiation.

Cholestyramine and colestipol resins—Absorption of hydrochlorothiazide is impaired in the presence of anionic exchange resins. Single doses of either cholestyramine or colestipol resins bind the hydrochlorothiazide and reduce its absorption from the gastrointestinal tract by up to 85 and 43 percent, respectively.

Corticosteroids, ACTH—intensified electrolyte depletion, particularly hypokalemia.

Pressor amines (e.g., norepinephrine)—possible decreased response to pressor amines but not sufficient to preclude their use.

Skeletal muscle relaxants, nondepolarizing (e.g., tubocurarine)—possible increased responsiveness to the muscle relaxant.

Lithium—should not generally be given with diuretics. Diuretic agents reduce the renal clearance of lithium and add a high risk of lithium toxicity. Refer to the package insert for lithium preparations before use of such preparations with VASERETIC.

**Non-steroidal Anti-inflammatory Drugs:** In some patients, the administration of a non-steroidal anti-inflammatory agent can reduce the diuretic, natriuretic, and antihypertensive effects of loop, potassium-sparing, and thiazide diuretics. Therefore, when VASERETIC and non-steroidal anti-inflammatory agents are used concomitantly, the patient should be observed closely to determine if the desired effect of the diuretic is obtained.

**Carcinogenesis, Mutagenesis, Impairment of Fertility:** Enalapril in combination with hydrochlorothiazide was not mutagenic in the Ames microbial mutagen test with or without metabolic activation. Enalapril-hydrochlorothiazide did not produce DNA single strand breaks in an *in vitro* alkaline elution assay in rat hepatocytes or chromosomal aberrations in an *in vivo* mouse

\* Registered trademark of Hospal Ltd.



bone marrow assay.

**Enalapril Maleate:** There was no evidence of a tumorigenic effect when enalapril was administered for 106 weeks to rats at doses up to 90 mg/kg/day (150 times the maximum daily human dose). Enalapril has also been administered for 94 weeks to male and female mice at doses up to 90 and 180 mg/kg/day, respectively, (150 and 300 times the maximum daily dose for humans) and showed no evidence of carcinogenicity.

Neither enalapril maleate nor the active diacid was mutagenic in the Ames microbial mutagen test with or without metabolic activation. Enalapril was also negative in the following genotoxicity studies: reverse mutation assay with *E. coli*, sister chromatid exchange with cultured mammalian cells, and the micronucleus test with mice, as well as in an *in vitro* cytogenetic study using mouse bone marrow.

There were no adverse effects on reproductive performance in male and female rats treated with 10 to 90 mg/kg/day of enalapril.

**Hydrochlorothiazide:** Two-year feeding studies in mice and rats conducted under the auspices of the National Toxicology Program (NTP) uncovered no evidence of a carcinogenic potential of hydrochlorothiazide in female mice (at doses of up to approximately 600 mg/kg/day) or in male and female rats (at doses of up to approximately 100 mg/kg/day). The NTP, however, found equivocal evidence for hepatocarcinogenicity in male mice.

Hydrochlorothiazide was not genotoxic *in vitro* in the Ames mutagenicity assay of *Salmonella typhimurium* strains TA 98, TA 100, TA 1535, TA 1537, and TA 1538 and in the Chinese Hamster Ovary (CHO) test for chromosomal aberrations, or *in vivo* in assays using mouse germinal cell chromosomes, Chinese hamster bone marrow chromosomes, and the *Drosophila* sex-linked recessive lethal trait gene. Positive test results were obtained only in the *in vitro* CHO Sister Chromatid Exchange (clastogenicity) and in the Mouse Lymphoma Cell (mutagenicity) assays, using concentrations of hydrochlorothiazide from 43 to 1300 µg/mL, and in the *Aspergillus nidulans* non-disjunction assay at an unspecified concentration.

Hydrochlorothiazide had no adverse effects on the fertility of mice and rats of either sex in studies wherein these species were exposed, via their diet, to doses of up to 100 and 4 mg/kg, respectively, prior to conception and throughout gestation.

**Pregnancy:** *Pregnancy Category C* (first trimester) and *D* (second and third trimesters). See WARNINGS, *Pregnancy*.

**Lactation:** Enalapril and enalaprilat are detected in human milk in trace amounts. Thiazides do appear in human milk. Because of the potential for serious reactions in nursing infants from their drug, a decision should be made whether to discontinue nursing or to discontinue VASERETIC, taking into account the importance of the drug to the mother.

**Polating Use:** Safety and effectiveness in children have not been established.

**ADVERSE REACTIONS:** VASERETIC has been evaluated for safety in more than 1500 patients, including over 300 patients treated for one year or more. In clinical trials with VASERETIC no adverse experiences peculiar to this combination drug have been observed. Adverse experiences that have occurred, have been limited to those that have been previously reported with enalapril or hydrochlorothiazide.

The most frequent clinical adverse experiences in controlled trials were: dizziness (8.6 percent), headache (5.5 percent), fatigue (3.9 percent) and cough (3.5 percent). Adverse experiences occurring in greater than two percent of patients treated with VASERETIC in controlled clinical trials were: muscle cramps (2.7 percent), nausea (2.5 percent), asthenia (2.4 percent), orthostatic effects (2.3 percent), impotence (2.2 percent), and diarrhea (2.1 percent).

Clinical adverse experiences occurring in 0.5 to 2.0 percent of patients in controlled trials included: *Body As A Whole:* Syncope, chest pain, abdominal pain; *Cardiovascular:* Orthostatic hypotension, palpitation, tachycardia; *Digestive:* Vomiting, dyspepsia, constipation, flatulence, dry mouth; *Nervous/Psychiatric:* Insomnia, nervousness, paresthesia, somnolence, vertigo; *Skin:* Pruritus, rash; *Other:* Dyspnea, gout, back pain, arthralgia, diaphoresis, decreased libido, tinnitus, urinary tract infection.

**Angioedema:** Angioedema has been reported in patients receiving VASERETIC (0.6 percent). Angioedema associated with laryngeal edema may be fatal. If angioedema of the face, extremities, lips, tongue, glottis and/or larynx occurs, treatment with VASERETIC should be discontinued and appropriate therapy instituted immediately. (See WARNINGS.)

**Hypotension:** In clinical trials, adverse effects relating to hypotension occurred as follows: hypotension (0.9 percent), orthostatic hypotension (1.5 percent), other orthostatic effects (2.3 percent). In addition syncope occurred in 1.3 percent of patients. (See WARNINGS.)

**Cough:** See PRECAUTIONS, *Cough*.

**Clinical Laboratory Test Findings, Serum Electrolytes:** See PRECAUTIONS.

**Creatinine, Blood Urea Nitrogen:** In controlled clinical trials minor increases in blood urea nitrogen and serum creatinine, reversible upon discontinuation of therapy, were observed in about 0.6 percent of patients with essential hypertension treated with VASERETIC. More marked increases have been reported in other enalapril experience. Increases are more likely to occur in patients with renal artery stenosis. (See PRECAUTIONS.)

**Serum Uric Acid, Glucose, Magnesium, and Calcium:** See PRECAUTIONS.

**Hemoglobin and Hematocrit:** Small decreases in hemoglobin and hematocrit (mean decreases of approximately 0.3 g percent and 1.0 vol percent, respectively) occur frequently in hypertensive patients treated with VASERETIC but are rarely of clinical importance unless another cause of anemia coexists. In clinical trials, less than 0.1 percent of patients discontinued therapy due to anemia.

**Liver Function Tests:** Rarely, elevations of liver enzymes and/or serum bilirubin have occurred. Other adverse reactions that have been reported with the individual components are listed below and, within each category, are in order of decreasing severity.

**Enalapril Maleate:** Enalapril has been evaluated for safety in more than 10,000 patients. In clinical trials adverse reactions which occurred with enalapril were also seen with VASERETIC. However, since enalapril has been marketed, the following adverse reactions have been reported: *Body As A Whole:* Anaphylactoid reactions (see PRECAUTIONS, *Hemodialysis Patients*); *Cardiovascular:* Cardiac arrest, myocardial infarction or cerebrovascular accident, possibly secondary to excessive hypotension in high risk patients (see WARNINGS, *Hypotension*); pulmonary embolism and infarction; pulmonary edema, rhythm disturbances including atrial tachycardia and bradycardia; atrial fibrillation; hypotension; angina pectoris; *Digestive:* Ileus, pancreatitis, hepatitis, hepatocellular (proven or rechecked) or cholestatic jaundice, melena, anorexia, glossitis, stomatitis, dry mouth; *Hematologic:* Rare cases of neutropenia, thrombocytopenia and bone marrow depression. Hemolytic anemia, including cases of hemolysis in patients with G-6-PD deficiency, has been reported; a causal relationship to enalapril has not been established. *Nervous System/Psychiatric:* Depression, confusion, ataxia, peripheral neuropathy (e.g., paresthesia, dysesthesia); *Urogenital:* Renal failure, oliguria, renal dysfunction (see PRECAUTIONS), flank pain, gynecostasis; *Respiratory:* Pulmonary infiltrates, bronchospasm, pneumonia, bronchitis, rhinorrhea, sore throat and hoarseness, asthma, upper respiratory infection; *Skin:* Exfoliative dermatitis, toxic epidermal necrolysis, Stevens-Johnson syndrome, herpes zoster, erythema multiforme, urticaria, pemphigus, alopecia, flushing, photosensitivity; *Special Senses:* Blurred vision, taste alteration, anosmia, conjunctivitis, dry eyes, tearing.

**Miscellaneous:** A symptom complex has been reported which may include a positive ANA, an elevated erythrocyte sedimentation rate, arthralgia/arthritis, myalgia/myositis, fever, serositis, vasculitis, leukocytosis, eosinophilia, photosensitivity, rash and other dermatologic manifestations.

**Fetal/Neonatal Morbidity and Mortality:** See WARNINGS, *Pregnancy*, *Enalapril Maleate*, *Fetal/Neonatal Morbidity and Mortality*.

**Hydrochlorothiazide:** *Body as a Whole:* Weakness; *Digestive:* Pancreatitis, jaundice (intrahepatic cholestatic jaundice), sialadenitis, cramping, gastric irritation, anorexia; *Hematologic:* Aplastic anemia, agranulocytosis, leukopenia, hemolytic anemia, thrombocytopenia; *Hypersensitivity:* Purpura, photosensitivity, urticaria, necrotizing angitis (vasculitis and cutaneous vasculitis), fever, respiratory distress including pneumonitis and pulmonary edema, anaphylactic reactions; *Musculoskeletal:* Muscle spasm; *Nervous System/Psychiatric:* Restlessness; *Renal:* Renal failure, renal dysfunction, interstitial nephritis (see WARNINGS); *Skin:* Erythema multiforme including Stevens-Johnson syndrome, exfoliative dermatitis including toxic epidermal necrolysis, alopecia; *Special Senses:* Transient blurred vision, xanthopsia.

\* Based on patient weight of 50 kg.

For more detailed information, consult your DuPont Pharma Representative or see Prescribing Information.

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Issued June 1993  
7432318

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## Correspondence

Kudos to Tom Dean for his eloquent and timely discussion of health care reform (SDJM - September 1993). His conclusions are "right on".

If we are to avoid a single payer approach (like the onerous Post Office system!), the main elements of the Clinton plan must be passed by Congress and implemented. Its success will depend on:

1. special interest groups' willingness to sacrifice some of their autonomy and;
2. each state's ability to carry out its responsibility.

The late Governor Mickelson promoted insurance reform legislation to "get the ball rolling". It was shot down by the insurance industry and political expediency. Hopefully the new administration and a responsible legislature can recapture Governor Mickelson's initiative and move on.

What is the alternative? If the Clinton plan fails to control costs (I'm dubious!) and health care costs soar to the two trillion mark per year, there is little doubt what kind of system the American people will opt for a few years down the road!

Reuben Bareis, MD  
Rapid City, SD



## The "Other" Ingredients

Helen Fiechtner, Pharm.D., Sioux Falls, SD.

Johnny has just received prescriptions from his physician for an oral antibiotic and an antihistamine/decongestant combination. Often overlooked is the fact that Johnny will not only receive the intended medications, he will also frequently ingest many other ingredients.

Pharmaceutical products contain many "inactive" ingredients necessary for the formulation of a stable and palatable product. Sweeteners, flavorings, coloring agents, preservatives, emulsifiers, solubilizers, fillers, diluents, antioxidants and alcohols are the main categories of inactive ingredients found in drug products. While in most patients the "inactive" ingredients are not a problem, adverse reactions from these agents do occur. These reactions range from diarrhea and contact dermatitis to life threatening anaphylactoid reactions and dysrhythmias. Because the product labeling frequently does not include complete information on the supposedly inactive ingredients, the specific ingredient that caused the adverse reaction may be difficult to determine. Avoiding the offending ingredient in another product may also be difficult due to this lack of product labeling. Some "inactive" ingredients such as ethanol, sorbitol and propylene glycol are really chemicals with considerable potential activity.

Ethanol has been used for centuries in the preparation of medications. It currently is less of a problem than in the past when the amount of ethanol per dose in many older preparations caused sedation and other effects in children. Concern about ethanol in many pediatric liquid products led the American Academy of Pediatrics in 1985 to develop a recommendation on ethanol containing drug products, specifically that ethanol in the product should not cause a blood ethanol level greater than 25 mg/ml after a single dose or with repeated dosing. Some drug products were reformulated after this recommendation was made and most new drug products contain little ethanol. Elixir was allowed to stay in the name of a few products although all the ethanol was removed. e.g., Tylenol Elixir®. Except for occasional problems seen with higher doses of Phenobarbital Elixir, normal dosing with most ethanol containing drug products today cause few problems in children.

Sorbitol, a polyhydric alcohol, is commonly used as a sweetening agent. It also improves solution stability and reduces crystallization of syrup vehicles. Pharmacologically, sorbitol is a hyperosmotic laxative that can cause diarrhea, flatulence and abdominal pain. Be-

cause sorbitol does not raise blood glucose concentration, it is used in many "Sugar-Free" products. A frequent scenario is the diabetic or dieter who gets diarrhea from eating too many sugar-free products made with sorbitol. Some liquid pharmaceutical products contain enough sorbitol to cause diarrhea in susceptible patients or when high doses are used. Various liquid theophylline formulations contain sorbitol and are common offenders.

Propylene glycol is an important drug solubilizer found in many topical, oral and parenteral products. The list of potential adverse reactions with this chemical is long and includes hyperosmolality, contact dermatitis, dysrhythmias, CNS depression, respiratory depression, thrombophlebitis, lactic acidosis, hemolysis, seizures and hypotension. The parenteral forms of phenytoin, diazepam, and digoxin have propylene glycol in high concentrations, included to keep a poorly soluble drug in solution. The propylene glycol contributes to the frequent thrombophlebitis seen with these drugs. Phenytoin (Dantin®) in particular, is well known for the risk of dysrhythmias with rapid intravenous administration. This is due to the propylene glycol in phenytoin injection. Other adverse reactions seen with the rapid administration of propylene glycol are respiratory depression, hypotension and seizures. Propylene glycol is likely here to stay and we all need to be aware of its potentially serious adverse reactions in some parenteral products.

These are just a few possibilities of unintended, additional effects that may lurk within an otherwise straight forward liquid medication prescription. When dealing with idiosyncratic reactions, an awareness of these additives and potential adverse effects is useful.



Edited by Brian Kaatz, Pharm.D.





# Molecular Medicine: A Primer For Clinicians

## Part IV: Cystic Fibrosis and the Power and Limitations of Molecular Medicine

*Dept of Biochemistry and Molecular Biology. Edited by Ronald Lindahl, Ph.D and Rodney Parry, MD*

### ABSTRACT

Cystic fibrosis (CF) is among the most common genetic diseases in caucasians of Northern European ancestry. The cloning of the gene responsible for cystic fibrosis, the characterization of the product of the gene and identification of mutations occurring in CF patients are excellent examples of the potential clinical utility of molecular medicine. The ethical issues associated with the ability to identify carriers of CF mutations highlight the magnitude of the questions molecular medicine raises.

### INTRODUCTION

This is the fourth paper in our series relating recent advances in molecular biology to the clinical practice of medicine. The first three papers described the basics of human gene expression<sup>1</sup> and several of the methods commonly used in molecular biology.<sup>2,3</sup> With this background, we now begin a group of presentations illustrating how the tools of molecular biology are beginning to revolutionize the day to day practice of medicine. We will attempt to integrate basic research with its clinical applications and discuss some of the major ethical concerns generated by molecular medicine. Readers are encouraged to refer to the earlier papers as necessary to refresh the terminology and for details of the methods described here.<sup>1-3</sup>

Our first example of the clinical application of the tools of modern molecular biology is cystic fibrosis. Cystic fibrosis (CF) is an excellent example of how the use of molecular tools can directly impact clinical practice. The cloning of the CF gene and characterization of its protein product have resulted in an understanding of disease etiology not possible by any other approach. Identification of mutations in the CF gene and their effect on CF protein function have resulted in improved diagnosis and treatment protocols. Detection of mutant CF alleles provides the basis for screening of at-risk couples and prenatal detection of disease. Molecular tools also offer the potential for a gene therapy-based cure for CF.

Cystic fibrosis is among the most common genetic diseases in caucasians of northern European ancestry. The frequency of the disease is approximately 1 in 2500 newborns in the United States. The disease is inherited as an autosomal recessive with a carrier frequency estimated to be 1 in 25. The disorder is characterized by excessive mucus accumulation which results in chronic obstruction of the respiratory, gastrointestinal and reproductive tracts. Obstruction of the lungs and the pancreas lead to the most common clinical problems, chronic respiratory infections and pancreatic enzyme insufficiency. Of course, the classical diagnostic marker is increased sweat electrolytes. Several excellent reviews have appeared recently which summarize various aspects of this disease and its molecular basis.<sup>4-7</sup> Much of the following discussion is based on these papers. Readers are referred to the literature cited in the reviews for more detailed information.

### THE CF GENE

The clinical presentation of patients with cystic fibrosis has been well-documented for decades. Using the spectrum of clinical symptoms as a guide, a variety of research approaches led to the hypothesis that the basic pathophysiological defect in CF is an alteration in epithelial cell ion and fluid transport.<sup>5</sup>

However, as late as 1989, the underlying genetic basis of CF was unknown. In the mid 1980s, classical genetic linkage analysis using a series of polymorphic protein and DNA (RFLP) markers placed the CF gene on the

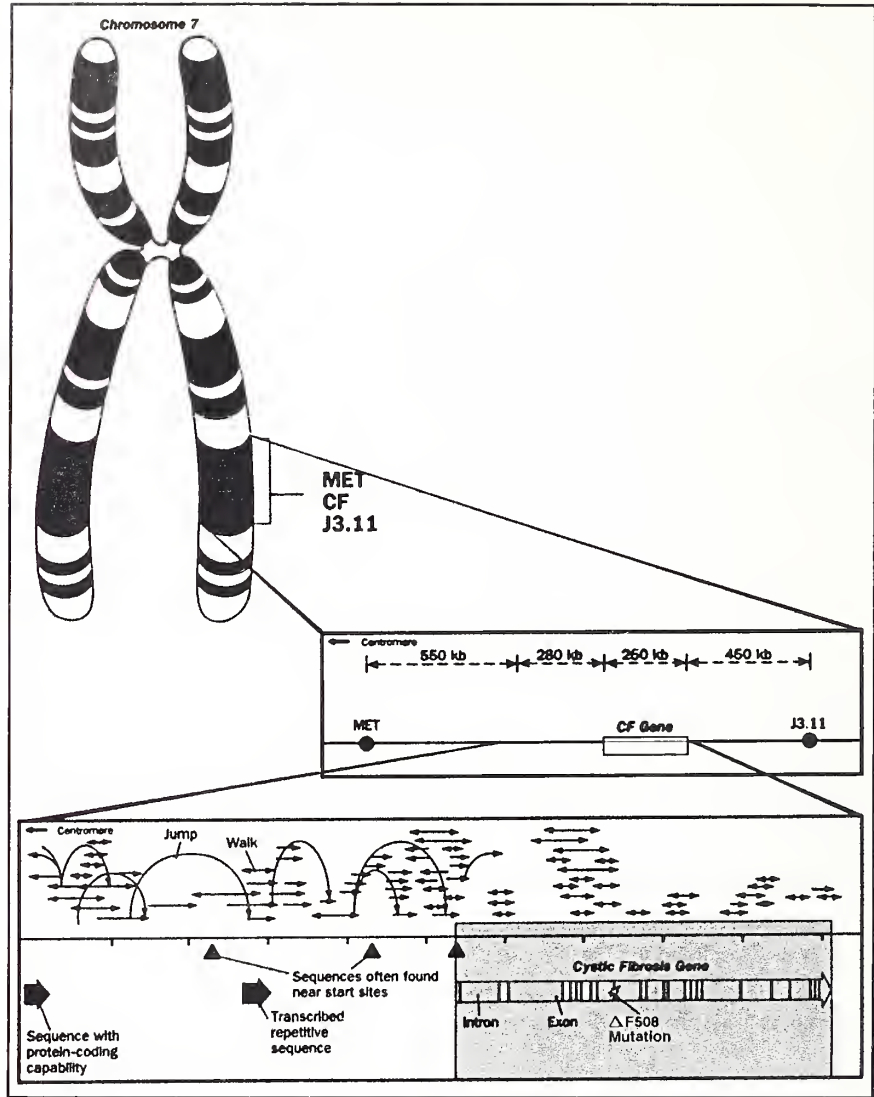


long arm of human chromosome 7.<sup>5</sup> Subsequent RFLP analysis using genomic DNA libraries containing only human chromosome 7 genetic material further localized the CF gene to a region of 1.5 Mb (million base pairs) of the 150 Mb long chromosome. The methods of positional cloning or reverse genetics described previously<sup>2</sup> were then used to "walk" along this chromosomal fragment searching for DNA sequence features that are consistent with the properties of a protein-encoding gene. This further narrowed the location of the CF gene to a region of chromosome 7 of approximately 500,000 base pairs (bp) (Figure 1). Direct DNA sequencing and computer analysis of the sequences obtained indicated that this region could potentially encode several proteins. However, Northern blot analysis indicated that none of the candidate CF genes were expressed in tissues affected in CF.

Having narrowed the search to such a small region of the genome meant that researchers could now screen cDNA libraries made from mRNA isolated from tissues expected to express the CF gene, such as sweat glands. The probe used to screen this library was one that contained a very small sequence of the 500,000 bp region suggested by computer analysis to be a single exon of a gene. This probe identified one cDNA clone that recognized a single mRNA from a variety of tissues expected to express the CF gene. Further screening of the cDNA library isolated several additional overlapping cDNAs that together encoded a protein possessing physical and functional properties consistent with it being the CF gene product.<sup>8-10</sup>

Using the cDNAs as probes in Northern analysis revealed that the CF mRNA was 6,500 bp long. This very large transcript can be detected in a variety of tissues, including the lung, pancreas, sweat glands and colon, that are affected in CF. When the 500,000 bp genomic fragment was examined for the location of the corresponding cDNA sequences, it was found that the CF gene spanned 250,000 base pairs (Figure 1). The CF gene consists of 27 exons (protein coding regions) separated by 26 introns.<sup>9</sup>

The cystic fibrosis gene was the first human disease gene identified using the techniques of modern molecular biology, including positional cloning. Subsequently, many other disease genes have been cloned and characterized with the only starting knowledge



**Figure 1**  
Localization of the cystic fibrosis gene. The techniques of positional cloning and extensive DNA sequencing were used to locate the cystic fibrosis gene on chromosome 7. Taken from reference 16, with permission.

being their approximate location on a particular human chromosome. Dr Francis Collins, who was involved in the cloning of the CF gene, recently provided an excellent analogy for the magnitude of this type of molecular analysis. He described it as "looking for a very small object within a very large territory, like trying to locate a single burnt-out light bulb in the basement of a single home in the entire US and you start with absolutely no clues".<sup>11</sup>

### THE CF GENE PRODUCT

The tissue distribution of the CF transcript was consistent with the spectrum of tissues affected in CF. Based on sequencing of the full length CF cDNA, the predicted amino acid sequence of the CF gene product is a protein 1480 amino acids long.<sup>9</sup> Alignment of the predicted amino acid sequence with those of proteins of known function by searching protein sequence

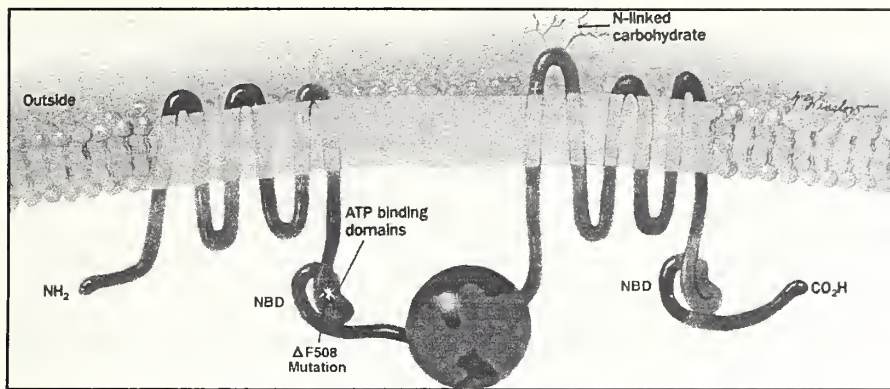


Figure 2

**Model of the structure of the Cystic Fibrosis Transmembrane Conductance Regulator (CFTR).** The model is based on the amino acid sequence deduced from the CF cDNA. The amino acid sequence was then compared by computer with databases containing all other known protein sequences. The resulting model of CFTR structure was predicted. The basic features of the model have been confirmed experimentally as the CFTR protein has been produced and analyzed extensively. Taken from reference 16, with permission.

databases, suggested that the CF gene product was a membrane-associated transport protein (Figure 2). This observation was important because the properties of the predicted gene product were consistent with the known clinical CF phenotype. The CF gene product has been designated the CF transmembrane conductance regulator (CFTR). This name aptly describes the structural and functional properties of the protein. The CFTR appears to be an energy-requiring cell membrane-spanning protein which acts as a channel for the transport of ions, especially chloride ions, across cell membranes. Since its isolation, the CFTR cDNA has been cloned into expression vectors and inserted into mammalian cells. The expressed, recombinant CFTR protein can either restore proper function to CF-defective cells or bestow ion transport properties to cells that would not otherwise transport such ions efficiently.<sup>12</sup>

## THE DEFECT IN CYSTIC FIBROSIS

The cloning and characterization of the CF gene provided the opportunity to establish the defect responsible for the disease. The predicted properties of the CFTR were consistent with defects in this protein being responsible for most of the clinical presentation of the disease. However, the only way to clearly establish this gene as the CF gene was to identify mutations in it in CF patients. Initially, sequencing of CF cDNAs from normal individuals

and several CF patients indicated only a single difference between the cDNAs. The single mutation is a deletion of 3 consecutive base pairs that results in the deletion of 1 amino acid from the protein which is 1480 amino acids long. The deletion causes the loss of the amino acid phenylalanine (F) that is normally present at position 508. The mutation is therefore referred to as the  $\Delta F508$  mutation (Figure 2). This mutation prevents the newly synthesized CFTR polypeptide from being properly processed and directed to the cell membrane. Since the  $\Delta F508$  CFTR does not insert itself into the cell membrane, it cannot function as a transmembrane ion transport protein. The  $\Delta F508$

mutation does not significantly affect CFTR function. Studies have shown the mutant CFTR can transport  $Cl^-$  ions and otherwise function properly. Thus, in the majority of CF patients, the defect is now understood at

Table I  
Cystic Fibrosis Mutations

| Class | Defect               | Example    | Frequency | Clinical Presentation |
|-------|----------------------|------------|-----------|-----------------------|
| I     | Protein Production   |            |           |                       |
|       | Nonsense mutations   | G542X      | 3.4       | PI                    |
|       | Frameshift           | 3905 ins T | 2.1       | PI                    |
| II    | Processing/Targeting | A1507      | 0.5       | PI                    |
|       |                      | ΔF508      | 67.5      | PI                    |
|       |                      | S549I      | Rare      |                       |
|       |                      | S549R      | 0.3       | PI                    |
|       |                      | Δ559T      | Rare      |                       |
|       |                      | N1303K     | 1.8       | PI                    |
| III   | Regulation           | G551D      | 2.4       | PI                    |
|       |                      | G551S      | Rare      | PS                    |
|       |                      | G1244#     | Rare      | PI                    |
|       |                      | S1255P     | Rare      | PI                    |
| IV    | Conduction           | R117H      | 0.8       | PS                    |
|       |                      | R334W      | 0.4       | PS                    |
|       |                      | R347P      | 0.5       | PS                    |

PI, pancreatic insufficiency; PS, pancreatic sufficiency. For each example, the number is the amino acid position in the CFTR protein. The one-letter code for the wild-type amino acid is to the left, the one-letter code for the mutant amino acid is to the right. For the frameshift, the number is the nucleotide position and ins T means an extra thymidine has been inserted at this location. Frequency of mutation is expressed at the percentage of all CF mutations. Examples shown account for 80% of known mutations. Any specific mutation may cause more than one type of dysfunction. For example,  $\Delta F508$  causes defective processing but may also cause defective regulation, and R117H causes both defective conduction and decreases the time that the channel is open. Taken from reference 7, with permission.



the molecular level to be one of improper protein localization rather than improper protein function.

Subsequent studies used Southern Blot analysis of genomic DNA from CF patients and normal individuals to detect the  $\Delta F508$  mutation. The probes were oligonucleotides specific for the normal or  $\Delta F508$  mutant CF alleles. These studies confirmed the presence of the  $\Delta F508$  mutation in approximately two-thirds of all CF patient chromosomes and in no normal chromosomes. The absolute correlation between the presence of the mutation and the cystic fibrosis phenotype in the majority of patients strongly implied that the CF gene had been identified.

In rapid succession a number of other, less frequent mutations in the CF gene were identified (Table 1). The  $\Delta F508$  mutation is by far the most common, continuing to account for over two-thirds of all mutations. However, over 200 other CF mutations have been identified.<sup>6</sup> Five of these account for an additional 10% of all CF mutants, the remainder being much rarer. There is considerable geographic variation in the frequency of mutations. For example, while the  $\Delta F508$  mutation is most common in North America (70%) and in Northern Europe (87% in Denmark), it is much rarer in Southern Europe (< 40% in Italy).

Mutations in the CF gene have been divided into 4 groups depending on whether the mutation effects CFTR protein production (Class I), CFTR processing into a functional molecule (Class II), its ability to transport ions (Class IV), or regulation of CFTR function (Class III) (Figure 3 and Table I). The classification of mutations also provides clues to clinical phenotype heterogeneity and may be useful in treating CF patients.<sup>6</sup> Class I and II mutants, affecting either CFTR production or proper targeting to the cell membrane, are associated with a more serious clinical phenotype. Conversely, Class III and IV mutations, affecting ion channel function or regulation, are associated with a less severe clinical presentation. The variability in the clinical CF phenotype may be accounted for in part by

the large number of mutations. While individuals homozygous for the  $\Delta F508$  mutation are most common, many CF patients are either heterozygotes for  $\Delta F508$  and another mutation or heterozygous for two non- $\Delta F508$  mutations. Since different mutations affect different aspects of CFTR function, it would be expected that considerable clinical heterogeneity would be found in these non  $\Delta F508$  CF patients.

## IMPACT OF CF MOLECULAR BIOLOGY ON THE CLINICAL PHENOTYPE

**Effect on Treatment.** How has cloning of the CF gene and characterization of the CFTR affected treatment and diagnosis of cystic fibrosis? Detailed knowledge of how the CFTR works and how various mutations affect its activity should provide the basis for the rational design of improved, perhaps even individualized, treatment. CF patients with Class III and IV CFTR defects may be treated with drugs that can alter channel opening and closing, since the CFTR is synthesized and targeted properly and only lacks proper regulation of function. However, since Class III and IV mutations are rare, only a small proportion of all CF patients could be treated with this approach. In spite of this, the development of appropriate pharmacological agents seems likely in the near future.

Class I and II mutants are more difficult to treat. However, since the  $\Delta F508$  mutant is functional, but improperly located in the cell, treatments have been suggested that would promote proper targeting of the apparently functional  $\Delta F508$  CFTR to the cell membrane to restore proper ion transport and alleviate symptoms.<sup>6</sup> Not all of the mutant CFTR molecules would need to reach the cell membrane, as even low levels of expression of recombinant CFTR in cultured membrane cells are apparently sufficient to make the cells transport ions normally. Since most cells have redundant systems for ion transport, it is also possible that therapeutic agents can be developed that will activate or stimulate other channels to replace the loss of CFTR function. This approach would work for all CF patients since it completely bypasses the CFTR.

Two molecular-based approaches for the treatment of CF are also under active investigation. One is direct CF gene therapy. The general strategy is to insert a functional CF gene, most likely in the form of an expression vector carrying the CF cDNA, into CF cells under conditions by which the inserted gene can be expressed. Such experiments have been done and the results are promising. In one *in vivo* experiment, an expression vector carrying the human CF cDNA was instilled into the respiratory tract of rats and expression of CFTR for up to 6 weeks in airway epithelial cells was demonstrated.<sup>13</sup> While there are many unanswered questions, (including the safety of the expression vectors used, can sufficient levels of CF gene expression be maintained, is CFTR overexpression harmful and how can other cell types affected in CF, such as pancreatic cells, be targeted), the results suggest that CF gene

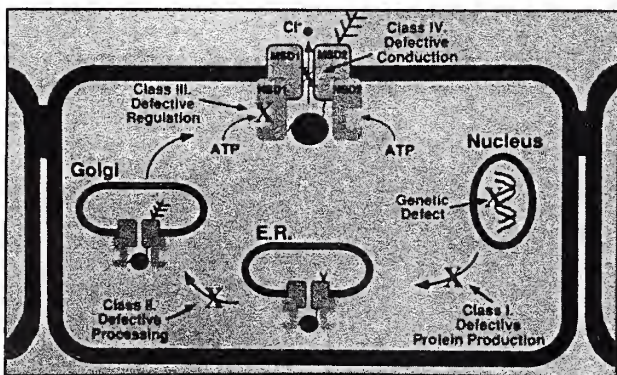


Figure 3

CFTR synthesis and function. The synthesis, intracellular processing and plasma membrane location of the CFTR are depicted. E.R., endoplasmic reticulum; MSD and NBD, membrane-spanning and nucleotide-binding domains of the CFTR. Xs represent sites of various classes of CFTR mutations. Taken from reference 7 with permission.

therapy may be a clinical reality in the not too distant future.

The second approach is similar to that already taken for the treatment of insulin-dependent diabetes and congenital short-stature. For both, *in vitro*-produced recombinant human insulin or growth hormone, respectively, are administered. For CF, the method would involve production of large amounts of recombinant human CFTR and delivery of the recombinant protein to affected cells. Treating CF in this manner is more difficult than either insulin or growth hormone because not only must an adequate delivery system be developed, but also the recombinant CFTR must be taken up and inserted properly in to the membrane of affected cells to restore normal function. While expression of human recombinant CFTR has been achieved, the delivery and targeting systems remain to be perfected.

**Effect of Diagnosis.** Reliable prenatal diagnosis of a genetic disease is an invaluable, but most often elusive, tool for the clinician. Accurate, sensitive, prenatal assessments can be useful in advising expectant at-risk couples. Such tests can also be used in establishing likelihoods for individual couples as a means of family planning. However, these two uses of prenatal diagnosis of genetic disease carry with them very different and difficult ethical questions which practicing physicians must address.

Improved therapies now extend the life expectancy of those affected with CF into their late 20s. As a result, the family planning decisions facing them become greater. Not only must they consider their desire to have a family, but they must also try to predict the quality of life a CF patient can expect in the future. These are considerations which impact on all those who must make these decisions, CF patients, affected families and care-givers.

Prior to approximately 10 years ago, couples at risk for cystic fibrosis because of family history could only receive genetic counseling that advised them of the estimated risks based on the autosomal recessive Mendelian nature of the disease. In the mid 1980's the first reliable biochemical test for prenatal diagnosis of CF was developed. The amniotic fluid of women carrying CF fetuses possesses decreased levels of the fetal intestinal microvillar enzymes, glutamyl transpeptidase, aminopeptidase M and alkaline phosphatase. The microvillar enzyme test yields a correct diagnosis over 95% of the time, but its sensitivity and specificity are less than desirable.<sup>5,14</sup> As studies on the chromosomal localization of the CF gene identified closely linked genetic markers, RFLP analysis became a useful prenatal diagnostic marker, primarily for couples with a positive family history of CF. Couples without a family history of CF could also be analyzed if the RFLP analysis were extensive.

Following the cloning of the CF gene and identification of the  $\Delta F508$  mutation, it was believed by many investigators that diagnosis of CF by direct detection of the mutation would be possible. However, since the

$\Delta F508$  mutation frequency varies geographically, and presumably among ethnic groups, and since a large number of additional mutations account for non- $\Delta F508$ -caused CF, this early enthusiasm has been tempered considerably.<sup>5,14</sup>

These same problems have also caused proposals for large-scale, population-based genetic screening for CF to be met with extreme caution and concern. Elias et al. provide a detailed discussion of the issues involved in large-scale screening based on our current knowledge of CF.<sup>14</sup> Assuming a screening test based only on the presence or absence of the  $\Delta F508$  mutation, two parents who are carriers of  $\Delta F508$  mutation have a 1 in 4 chance of having a CF child and prenatal screening to determine the status of the child based on the  $\Delta F508$  mutation would be absolute.

The difficulties arise when one or both parents are negative for the  $\Delta F508$  mutation. Since  $\Delta F508$  accounts for only 75% of all CF mutations, a significant likelihood remains that either or both parents carry a rare mutation. With only one parent positive for  $\Delta F508$ , the risk of a CF child is about 1 in 400. For both parents negative, the risk of a CF offspring is 1 in 40,000. If 95% of all CF mutations were detectable, the corresponding risks for 1 or 2  $\Delta F508$  negative parents producing a CF child declines to about 1 in 2000 and 1 in 1,000,000, respectively. Likewise, as a greater proportion of CF mutations are detectable, the likelihood of not detecting a carrier drops so that for 95% detectability, over 90% of two-carrier parents will be identified. Only in 1 of 500 parental screenings would two carriers of an CF mutation be missed.

These numbers become clinically relevant as new treatments lead to improved prognosis for CF patients and the possibility of a gene therapy-based cure. As more CF patients reach adulthood and consider starting a family, they want to know the risks of having affected children. This is especially important for those patients whose disease is not due to the  $\Delta F508$  mutation. The potential availability of screening tests also encourages siblings of CF patients to assess their chances of producing CF children.

Most human geneticists believe that for large-scale population-based screening for carrier status, at least 95% of all CF mutations must be detectable to assure that an unacceptably large number of true carriers are not missed. Since the 6 most common CF mutations account for only 85% of all mutations in the U.S. (Table II), it is clear that population-based screening for CF carrier status is still some way off. Several professional organizations including the American Society of Human Genetics and the American College of Obstetricians and Gynecologist have adopted policy statements which conclude that carrier status testing for CF in pregnant women and others is NOT yet the standard of care in medical practice.<sup>15</sup>

Moreover, large-scale screening tests raise a set of serious ethical questions that must be addressed before such screening programs can be implemented. Again, Elias et al. provide an excellent discussion of the issue.<sup>14</sup>



First, screening should be voluntary and confidentiality must be assured. Second, screening requires informed consent and informed consent requires adequate patient education and counseling. Third, quality control of all aspects of the testing procedure must be required. Last, all individuals must be assured access to screening programs. Until these issues are adequately discussed and resolved to the satisfaction of all involved, large scale genetic screening is likely to remain a future goal for most, if not all, diseases that have a major genetic component.

Both the power and limitations of modern molecular biology applied to human disease are illustrated in cystic fibrosis. The techniques of the molecular biologist have defined in minute detail the genetic basis of the disease. However, it has not yet been possible to translate knowledge of how defects in the CFTR function lead to the multiple clinical phenotypes of CF. Knowing the genetic basis of the disease has also allowed accurate diagnosis of the disease prenatally as well as assessment of risk. However, the number of different CF mutations and the variability of the clinical phenotype make the clinical utility of such information uncertain. Finally, genetic engineering has made effective, molecular-based treatments of, or a cure for CF probable. Again, however, translating success in model systems into clinical application seems too far in the future for the CF patient.

Although we have considered only one example, in the past four years similar progress has been made in understanding the molecular bases of many diseases. With each new discovery the same excitement ensues, followed by the sobering realization that delivery of the new information to the bedside is still some time in the future. Our next paper will consider the impact of molecular medicine on the diagnosis and treatment of one of the most common and dreaded diseases of all, cancer.

#### AUTHORS

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# An Analysis of the Medical Problems Causing Medicaid Patients to Present at a Community Hospital Emergency Room

*Robert W. Harms, MD, FACEP and Phyllis Beuckens, RN*

## INTRODUCTION

The perception seems to exist that patients enrolled in the Medicaid program utilize the emergency department for convenient care and that these patients frequently have medical problems that are not emergent in nature. Comments are also made that most of these patients could be seen during office hours by a local private physician. However, the above comments have been made without study of the nature of the presenting patient problem, its categorization of urgency, or correlation with whether a physician's office is open to see these patients.

## PURPOSE

To profile 200 consecutive Medicaid patients registered for treatment at Sioux Valley Hospital emergency department (ED). These patients were profiled for urgency of illness, whether presenting during usual physician office hours (8:00 am until 5:00 pm, Monday through Friday) or outside usual office hours (evening, night or weekend), and whether registering for local attending physician (physician practicing in the community with hospital privileges) or ED physician (assumes the patient has no local physician). The ages of these patients were also profiled.

## PROCEDURE

The charts of 200 consecutive Medicaid patients that registered for treatment were profiled. The charts were classified on the basis of the presenting complaint and diagnosis into groups of emergent, urgent, and non-urgent. The definition of an emergent illness was "an illness or injury that could be life or limb threatening and needs immediate attention". The definition of an urgent illness was "an illness or injury that is not life or limb threatening, but is time-sensitive and needs

prompt medical care". The definition of non-urgent illness was "an illness or injury that is neither life or limb threatening or time-sensitive". These definitions were obtained from the United States General Accounting Office report entitled, "Emergency Departments-Unevenly Affected by Growth and Change in Patient Use", dated January 1993 (GAO HRD-93-4).

Each group was then subclassified according to whether the patient presented during usual office hours or after usual office hours, whether the patient registering had a local attending physician or not, and the age range of the patient. The age ranges used were 0-5 years, 6-14 years, and 15 years or older.

## RESULTS

The duration of time needed to accumulate 200 (Table I) consecutive Medicaid patients registering for care at the emergency department was 39 days. This included 10 weekend days and no holidays, during February and March, 1993.

Sixty-six (66) charts were classified as emergent patient problems. Fifty-one (51) were profiled. Fifteen

Table I  
Summary of All Charts Profiled

|                       |          |                                   |
|-----------------------|----------|-----------------------------------|
| Total patient charts: | 200      | (185 profiled and 15 in hospital) |
| Emergent:             | 66(33%)  | (51 profiled and 15 in hospital)  |
| Urgent:               | 130(65%) | (all profiled)                    |
| Non-urgent:           | 4(2%)    | (all profiled)                    |
| Local Physicians:     | 152(82%) |                                   |
| No Local Physician:   | 33(18%)  |                                   |
| Usual Office Hours:   | 49(26%)  |                                   |
| After Usual Hours:    | 136(74%) |                                   |
| Age 0-5 years:        | 89(48%)  |                                   |
| Age 6-14 years:       | 27(14%)  |                                   |
| Age 15 or > years:    | 69(38%)  |                                   |



(15) of these patients were hospital inpatients at the time of the study and were not profiled. These (15) patients were classified as emergent since they had medical problems of a nature that necessitated hospital admission. Diagnosis included in the emergent category were croup, ectopic pregnancy, shortness of breath, palpitations, severe abdominal pain, chest pain, severe headache, bronchitis with dyspnea, severe dysuria due to urinary tract infection, severe back pain, post tonsillectomy and adenoidectomy complications requiring hospital admission, fractured ribs, closed head injury, ruptured ovarian cyst, exacerbation of asthma with severe dyspnea, severe hyperventilation, and cervical neck strain after motor vehicle injury. Of the patients presenting with emergent problems (Table II), 39 (76%) had a local physician and 12 (24%) had no local physician. Twenty (39%) patients presented during usual office hours and 31 (61%) presented outside usual office hours. Of those presenting during usual office hours, 14 (27%) had a local physician and 6 (12%) had no local physician. Sixteen (31%) were in the 0-5 year age group, 5 (10%) were in the 6-14 year age group, and 30 (59%) were in the age group 15 years and greater.

| Table II             |          |          |            |
|----------------------|----------|----------|------------|
|                      | Emergent | Urgent   | Non-urgent |
| Local Physician      | 39(76%)  | 110(85%) | 4(100%)    |
| No Local Physician   | 12(24%)  | 20(15%)  | 0(0%)      |
| Usual Office Hours   | 20(39%)  | 27(21%)  | 2(50%)     |
| With Local Physician | 14(27%)  | 23(18%)  | 2(50%)     |
| No Local Physician   | 6(12%)   | 4(3%)    | 0(0%)      |
| After Office Hours   | 31(61%)  | 103(79%) | 2(50%)     |
| Age 0-5 years        | 16(31%)  | 72(55%)  | 2(50%)     |
| 6-14 years           | 5(10%)   | 21(16%)  | 0(0%)      |
| 15 or > years        | 30(59%)  | 37(29%)  | 2(50%)     |

The urgent category included 130 patients and all charts were profiled. The problems included in this category were fever, ear pain, sore throat, lacerations, cough, wheezing (not severe), painful extremities (traumatic or non-traumatic), back pains, headaches, gastroenteritis, mild croup, animal bites, and rashes with pruritis. One hundred and ten (85%) of these patients had a local physician and 20 (15%) had no local physician. Twenty-seven (21%) presented during usual office hours and 103 (79%) presented outside usual office hours. Of the urgent category patients presenting during usual office hours, 23 (18%) had a local physician and 4 (3%) had no local physician. Seventy-two (55%) were in the 0-5 age group, 21 (16%) were in the 6-14 year age group, and 37 (28%) were in the age group 15 years and greater.

The non-urgent category included 4 patients and all charts were profiled. The problems included in this category were two mild rashes, a fussing infant (20 days after discharge from ICN for prematurity), and a re-

quest for blood pressure check and refill of blood pressure medication prescription. All 4 (100%) of the non-urgent patients had a local physician. Two (50%) presented during usual office hours and 2 (50%) presented outside usual office hours. Two (50%) were in the 0-5 year age group, 0 (0%) were in 6-14 year age group, and 2 (50%) were in the age group 15 years and greater.

## DISCUSSION

The emergent patient population seems large compared to the urgent and non-urgent numbers in this study. However, we think that it can be assumed that a large portion of patients with emergent complaints present to the emergency department initially and not a physician's office. Conversely, physician's offices likely do see and care for a large portion of urgent and almost all non-urgent patient problems that do occur and are never seen in the emergency department. The actual urgent and non-urgent patient numbers are probably much larger than documented in this study for the above reason.

This profile shows that the largest majority of Medicaid patients do have an identified local physician. Interestingly, this data also suggests that the lower the acuity of the problem, the more likely the patient does have a local physician when they use an emergency department. Two reasons likely explain this trend. First, when a problem is less urgent, patients will take time to find an office physician to care for that problem and, therefore, not use an emergency department. Secondly, the urgent group (lower acuity) is largely seen in the emergency department during hours when physician's offices are not usually open. Certainly many of these patients may have called their physician after hours and either been instructed to be seen in the emergency department or have determined that they could not wait until office hours to be seen for their problem. The subgroup with urgent complaints that did present during usual office hours is 27 (21%). Why were these patients not seen at the office? Was there no time available to be seen? Did they call the office and receive instruction to use the emergency department for their medical problem? Was their particular physician not in the office at that time? Did they choose on their own not to call the office? Did they fear a worse medical problem than was actually found? We do not know the answers. Perhaps, if more aggressively encouraged and accommodated, this group would be seen and treated at a physician's office; however, more study is needed to determine the answers to the above questions.

The non-urgent category is very small. Four patients presented for non-urgent complaints in 39 days and two of those did so after usual hours. This seems to demonstrate that our particular emergency department is used very infrequently for non-urgent complaints by Medicaid patients.

A difficulty in doing a study of this nature is deciding which medical complaints belong in the emergent, urgent, and non-urgent categories. The emergent category contained complaints of a severe nature (dyspnea, pain, etc) or concerning nature (chest pain, palpitations, etc). The urgent category contained complaints of pain, fever, etc. These complaints are not life or limb threatening, but are time dependent in their nature. Also, 72 (55%) of the urgent patients were the 0-5 year age group. Parents and physicians are more likely to recommend that these complaints be evaluated sooner than later in younger children.

It is interesting to observe that in the emergent group, 30 (59%) were age 15 and greater and that in the urgent group, 37 (28%) were in the age 15 group and greater. In order to explain this finding, a study of the nature of complaints needs to be done which we did not do.

A study was done at Boston City Hospital on low-income pediatric patients who were members of a managed care plan.<sup>2</sup> To use an emergency department for care, prior approval was needed by the patient. They found most emergency department visits (72%) were made when primary care sites were closed (i.e. outside usual off hours). In their study, 57% presented with urgent or emergent condition. In spite of the elaborate system for gatekeeping and prior approval before emergency department use, only 3% of patient requests for emergency department care were denied. They concluded that, for a variety of reasons, the majority of primary care physicians and emergency department staff found the gatekeeping policies for after hour visits burdensome and inappropriate.

Another study done at George Washington University Emergency Department looked at the motivation to use an emergency department for minor illness or injury during 9 am to 6 pm on weekdays (i.e. during usual office hours).<sup>3</sup> Their study group patients believed that less than 24 hours should elapse between onset of their problem and the time they receive medical care. They found no major difference in emergency department use for minor illness from different racial, educational and economic backgrounds. The patients who used the emergency department for minor illness tended to have lower frequency of chronic illness and often had no established health care provider. They chose the emergency department for its easy access and the wide scope of care that could be delivered.

A text discussing experiences in New York State with the public health model of Medicaid delivery and emergency room use stated that "high emergency room use is a public health issue, which cannot be resolved simply by measures taken inside the emergency department itself."<sup>4</sup> This issue is not merely one of inappropriate use; it is one of ensuring that all Medicaid recipients have access to continuous and quality primary care which will benefit their overall health status". This paper also stated "that low use of primary care is associated with high use of the emergency room and visa versa". In our study, most Medicaid patients did identify a local primary care physician and that likely explains why very

few patients presented for non-urgent problems. The fact that most urgent patient problems did not present during usual physician office hours means that many patients are utilizing their primary care physician's office during hours the offices are open.

## CONCLUSIONS

This study demonstrates that use of the emergency department for non-urgent complaints by Medicaid patients occurs very infrequently. Most Medicaid patients do have an identified local physician. The majority of patients that use the emergency department for urgent medical complaints do so when physician's offices are typically closed.

To lessen usage of the emergency department, the urgent patient population would need to lessen their usage of the emergency department and that would require patients with such conditions as fever, mild to moderate pain, and sore throats to wait to be seen until physician offices are typically open. There is a small group of patients with a local physician and urgent complaints that are seen in the emergency department during a time when the physician's office would typically be open; study needs to be done to determine why that group of patients chooses to be seen in the emergency department and not at the physician's office. The reasons may or may not be justified.

Finally, a generalization from this study is that the Medicaid patients in Sioux Falls do not utilize the emergency department for non-urgent medical care. In fact, Medicaid patients seem to be considerate in utilizing the emergency department appropriately, considering current availability of physician office hours.

We must all remind ourselves to not make generalizations about patient care patterns, utilization patterns, or medical need patterns until these areas of question and concern are well studied and knowledgeable conclusions can be reached. This profile looked at only one small subgroup of patients (200 Medicaid patients). What do the profiles of all the other major payor groups and age groups show? That question needs to be addressed before one group can be isolated and criticized for its utilization of medical care resources.

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# Extenuating Circumstances

*A periodic column of personal, ethical, and socioeconomic reflections on medicine.*

## The Musical Instrument Museum

*Richard M. Caplan, MD  
Medical Humanities  
The University of Iowa College of Medicine*

An internist friend with whom I've played chamber music for many years described (with enormous enthusiasm) his recent visit to a museum of musical instruments at the University of South Dakota in Vermillion. Had I known of it? Indeed not, but after his exuberant reaction to it—including the fact that he has never encountered a better collection or display in all his years of visiting musical instrument museums—I've resolved to see it, too. Because of personal interests plus my faculty activities in medical humanities and continuing medical education, my ruminations about that museum in Vermillion led me to wonder how many of South Dakota's physicians know about the museum, have visited it, or care a whit about its existence there. That I would even raise such a question suggests I think there is some connection between such a visit and being an effective physician. Indeed I do.

An admission, first-off: I wouldn't argue too strenuously about the specific virtues of a single visit to that particular museum. But I cheerfully will argue that museum visits provide a splendid way to increase one's general education. With that comes a fuller acquaintance with one's fellow humans—a better sense of what annoys them, pleases them, motivates them, excites them, prompts them to life choices of a desirable or undesirable sort, and so on.

"Reading" our patients can be fragmented into the usual categories of history-taking, physical examination, and special studies from the laboratory or the imaging department, but all may be termed the art of diagnosis. After that, our recommendations about therapy, if we are to be effective, require us to choose methods we think stand some chance of "selling" this patient on our recommendations. A great deal of success, then, boils down to knowing people. The broader our base of experience, whether direct or vicarious, and the more active it is, the greater the likelihood of serving our patient's best interests.

To make this example concrete, I invite you to consider the utility of an encounter with the musical instrument museum followed soon after with meeting a patient who plays an instrument or enjoys listening to any kind of music whatever (and this would include almost everyone). Do you suppose that museum visit might provide an entree into conversation—truly personal contact with the patient—even if, in truth, neither of you had previously visited it?

Although this might seem like a forced maneuver, I submit that it can serve you well. In fact, I challenge you to try this topic as an entry point for conversation/contact with the very next patient you encounter. Simply say, for example, that you just read an item by some goofy doctor in Iowa City who asked you to start speaking to your next patient about the museum in Vermillion to see where it would take you, and whether it wouldn't produce an interesting, useful, and satisfying outcome. And furthermore, I'll bet your patient will consider you a more interesting person than before.

If a fruitful or strange clinical event follows from this suggestion, or any consequence at all, please write the editor to tell him about it. He's promised to let me know. And I do hope to manage my own visit to that South Dakota treasure soon.

---

### Editor's Note

*Dr Caplan has a long standing interest in the subject of humanities in medicine. In April of this year, I attended a weekend reading retreat he conducted. Various aspects of medicine, as portrayed through works of literature, were discussed. Dr Caplan's interest and expertise in the field of humanities was very much evident in these sessions.*

*Jerome W. Freeman, MD  
Editor*

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The Medical School Excellence Fund is the oldest of the funds and the largest. These grants are unrestricted, which allows the medical schools to use the money where it is most needed. Often, these monies are the only unrestricted funds that the Deans may use. These Deans repeatedly stress their appreciation for the flexibility this allows in supporting varied activities. During our annual meeting in June, Robert C. Talley, MD, Dean of the University of South Dakota School of Medicine, reported on the use of the AMA-ERF funds he received during 1992. The USD Medical School received \$13,820.78 in AMA-ERF monies through the Medical School Excellence Fund. Over \$5,000 of these funds supported travel expenses for students to attend various national and regional meetings and medical student activities through the Medical Student Association. Support was given for the Sexually Transmitted

Diseases Committee to present programs to area high schools, \$300 was given to the medical student spouse group, while \$1,040 was used toward the graduation luncheon for the graduates and their guests. Another \$4,800 was given to support summer research stipends as well as travel funds to the regional and national student research forum for those participating. And a total of about \$2,500 was used to pay one-half of the student fees of "at risk" students at USD Medical School to enable them to take a special review course before their boards.

The Medical Student Assistance Fund requires that the school use the funds to help support bona fide educational expenses for medical students. An average of \$500,000 has been given each year to financial aid programs since the establishment of the Medical Student Assistance Fund in 1983. These monies can be used to assist students with temporary, interest-free loans to pull them through critical budgeting problems. As of June 9, 1993, the USD Medical School had received three checks totaling \$371.90 designated for student loans. According to Dr Talley, this money was added to a student loan fund managed by the South Dakota Medical School Endowment Association as part of the "Bequest Loan Fund". Dr Talley further explained that this loan fund is utilized by students who have special needs that preclude waiting for federal backed student loans or who have reached a maximum for loans from other sources. An example of the use of these monies would be a loan to a student to take a structured review course for the National Boards. (While a third year medical student, my husband received one of these "emergency loans"; we know first hand what a life saver they can be.)

Supporting the future of medical schools and medical students through AMA-ERF is tangible proof that the Alliance is dedicated to the continued welfare of our fellow man. Funds must be available if the tradition of quality care established by the American physicians is to continue. Giving to and through AMA-ERF helps achieve that goal by maximizing individual contributions, ensuring accountability, promoting visibility, and motivating and encouraging support. We must all agree with Ralph Waldo Emerson when he said: "It is one of the most beautiful compensations of life that no man can sincerely try to help another without helping himself."





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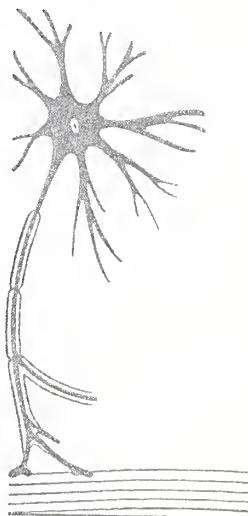
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SOUTH DAKOTA

December 1993  
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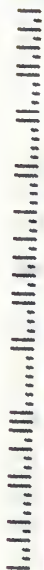
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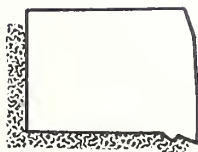
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# SOUTH DAKOTA JOURNAL OF MEDICINE

Volume 46/No. 12 December 1993

(ISSN 0038-3317)

Official Publication of the  
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the South Dakota Chapter of the  
American College of Surgeons  
the South Dakota Psychiatric Association  
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SOUTH DAKOTA JOURNAL OF MEDICINE (ISSN 0038-3317) is published monthly by the South Dakota State Medical Association, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Subscription price: \$15 per year domestic, \$18 per year foreign, \$1.75 for single copy. Second class postage paid at Sioux Falls, South Dakota 57101 and additional mailing offices. POSTMASTER: Send address changes to SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105.

NATIONAL ADVERTISING: Contact State Medical Journal Advertising Bureau, Inc, 711 South Boulevard, Oak Park, Illinois 60302. Phone: 708-383-8800.

LOCAL AND CLASSIFIED ADS: Contact Jeri Spars, SOUTH DAKOTA JOURNAL OF MEDICINE, 1323 South Minnesota Avenue, Sioux Falls, SD 57105. Phone: 605-336-1965.

PRINTER: The Ovid Bell Press, Inc, PO Box 370, Fulton, Missouri 65251-0370.

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## NEXT MONTH

The Doctor-Patient Relationship: Time Management  
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*About the Cover*

*"Parade" painted by well known South Dakota artist, Jean Bailey, now deceased, of rural Brandon, SD.*





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# Orf Virus Infection in Pregnancy

William J. Watson, MD, Mark W. Meyer, MD, Dean L. Madison, MD

## ABSTRACT

Orf virus infection is endemic among sheep and goats, and can occur in humans who handle these animals. Orf virus infection in humans causes a characteristic skin lesion, and systemic symptoms can occur. Very little is known about Orf virus infection in human pregnancy. A case of Orf virus infection, with onset at 33 weeks gestation, is presented. There were no pathological findings in the infant born at term, or in the placenta.

Orf virus, also called ecthyma virus, is a type of pox virus which causes a viral zoonosis in sheep and goats. The disease can be spread to humans by contact with infected animals, and causes a characteristic skin lesion, which most often occurs on the hands or fingers.<sup>1</sup> The incubation period is from 3 to 7 days.<sup>2</sup> Most often, infection is localized and self limited, but regional lymphadenopathy occurs in up to one third of the cases and systemic viral symptoms can be observed.<sup>1</sup>

We present a case of Orf virus infection in a pregnant patient seen in our practice.

## CASE REPORT

A 25 year old nulliparous Caucasian female presented at 33 weeks gestation with a complaint of a skin lesion on the right middle finger. The papular lesion was 1 cm in diameter, and erythematous, with central ulceration, and was painless (Figure 1). The patient worked on a farm and had been bottle feeding baby sheep during the preceding few weeks. There had been a recent outbreak of Orf virus infection in the sheep population.

To prevent secondary infection, the patient was treated with amoxicillin-clavulanic acid 250 mg three times daily for 7 days. The lesion resolved entirely in 5 weeks. She had an uncomplicated term delivery of a healthy female infant. Gross and microscopic placental pathology were unremarkable.

## DISCUSSION

The diagnosis of Orf virus infection rests on finding a characteristic skin lesion in a patient with a history of exposure to sheep or goats. The lesions can be single or multiple and most often occur on the hands or forearms. The differential diagnosis includes felon,<sup>2</sup> pyogenic granuloma, and vascular neoplasms.<sup>3</sup>



Figure 1

Photo of the lesion in our patient at 33 weeks gestation.



Figure 2

The lesion is raised, as seen in lateral view.



The virus can be isolated from the lesion and identified by electron microscopy, or by viral culture.<sup>1</sup> Because of the history obtained and characteristic lesion seen in our patient, a viral culture was not done.

We could find only one previous report on Orf virus infection in human pregnancy. Taieb et al, in France, reported a case of Orf infection in a gravida at 34 weeks gestation.<sup>4</sup> This patient had two lesions on the fingers, axillary lymphadenopathy, and fever. The infant had no sequelae of the disease. No microscopic examination of the placenta was mentioned.

From what limited information is available, it appears that Orf virus infection in the third trimester of pregnancy does not cause adverse fetal sequelae such as preterm birth or transplacental infection.

#### AUTHORS

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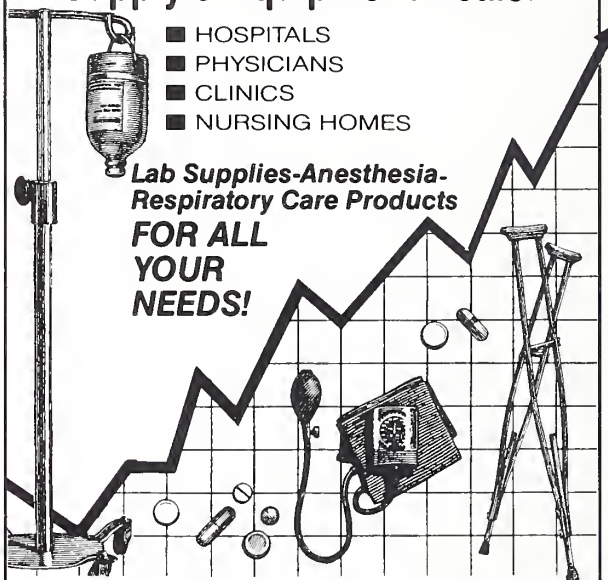
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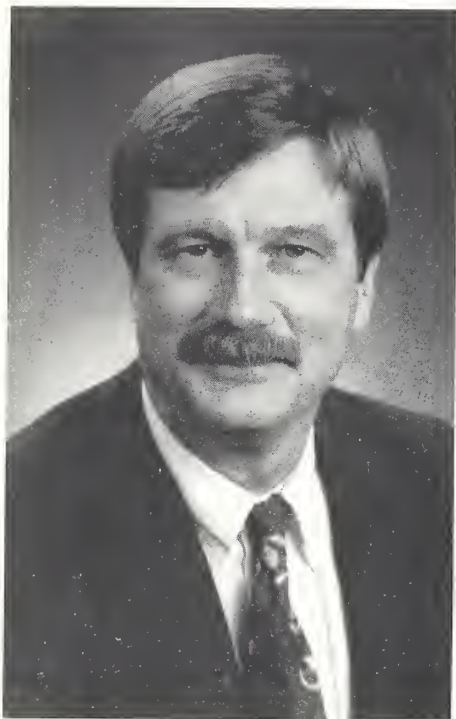
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**Thomas L. Krafska, MD, President  
South Dakota State Medical Association**

### Merry Christmas!

**M**y gift to you is to breathe (write) not a word about health system reform—but in this season of giving, I want to emphasize an opportunity we will have to benefit medicine, medical education and the people of South Dakota.

By now you have heard about the South Dakota Health Sciences Information Center. I don't intend to duplicate the information you will receive from other sources but want to direct your attention to it and encourage your support of this project. This age of rapidly developing information technology requires a new way to think about "libraries" and the proposed information center will afford South Dakota the opportunity to acquire the 21st Century technology early. Within a short time we will probably all have our practices linked by some sort of electronic network—and this "library" will then be one part of the network.

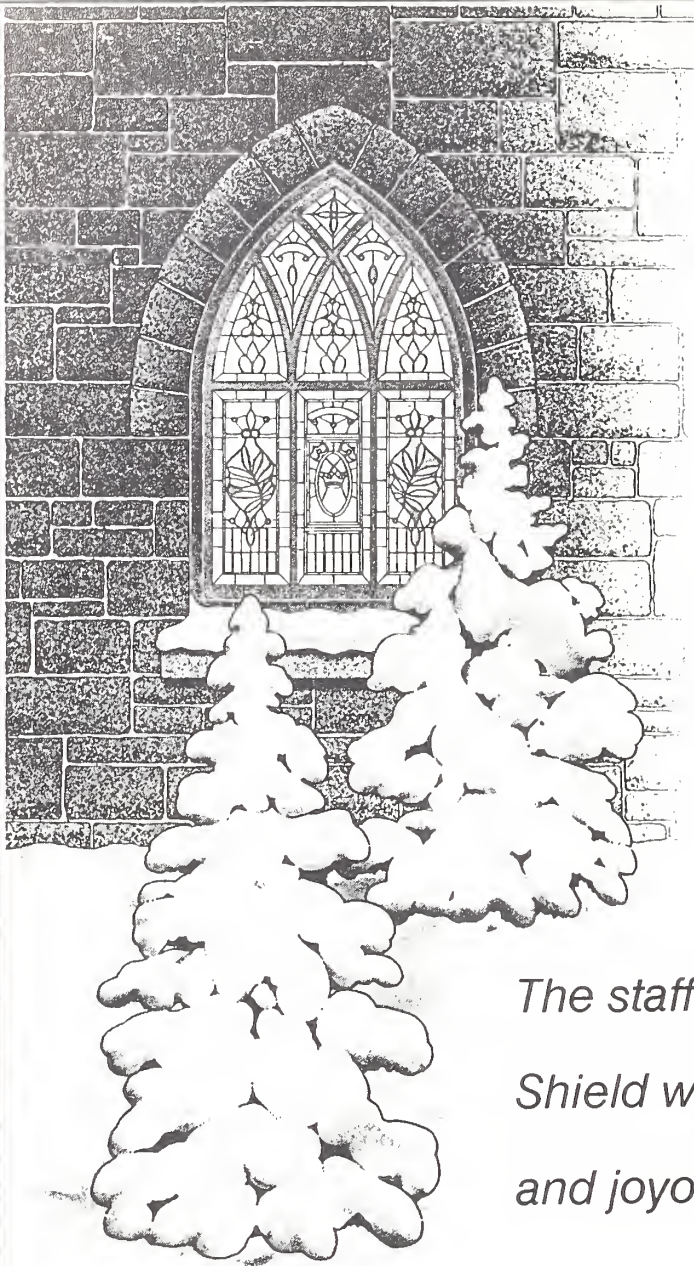
The project's success will depend largely on private and corporate generosity so it will be important for us to take a leadership role both by giving and helping to convince others of its importance. Having just returned

(tonight) from a fund raiser for a different worthy cause, I know each of you is besieged by requests especially during this holiday season, but I ask you to read the brochure and make time for the volunteer who will contact you.

I support the South Dakota Health Sciences Information Center—not because I'm a USD graduate (I'm not), but because I consider myself fortunate to have grown up and practiced in South Dakota. I am grateful for the opportunities afforded me both as a child and physician, and will consider this gift as returning my good fortune to the people of South Dakota.

Happy New Year!





*The staff of South Dakota Blue  
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and joyous holiday season.*



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## It's Kind of Hard To Explain in Court

There has been a great deal of discussion about the use of guidelines by physicians so that they can avoid litigation. I would like to relate one facet of a recent court case with a large settlement relating to a woman who developed fatal carcinoma of the cervix after having had negative pap smears. Guidelines or procedures practiced throughout the country were followed, but following these procedures was made to appear to be substandard medicine. It could not be explained well to the jury; and, maybe, I will not be able to explain this to fellow physicians in the editorial.

The field of gynecologic cytopathology has grown rapidly since World War II. Over this period of time, the volume of gyn pap smears has continued to grow; and, even now, many women do not have any or a less than adequate number of pap smears for optimal detection of cervical carcinoma or its precursors. The most efficient technique in gyn cytology has been found to employ specially trained cytologists who screen pap smears for abnormal cells and forward any slides with abnormal cells to pathologists for further interpretation. In fact, the performance of screening has been found to be more efficiently and accurately accomplished by trained cytologists than by many pathologists. Slides negative for abnormal cells are traditionally signed out by a cytologist with review of all smears with abnormal cells and a fixed number (often 10%) of normal slides by a pathologist. Screening is an arduous painstaking and labor intensive task which requires long spans of interrupted time. The interpreting of abnormalities found is best done by a cytopathologist or pathologist with cytology experience because correlation with histologic features is necessary.

During the recent trial it was pointed out that abnormal smears were referred to a pathologist and a fixed number (10%) were reviewed by a pathologist but negative smears were signed out by a cytologist. The plaintiff's attorney made a great point that pap smears were signed out by cytologists over a pathologists signature, but not reviewed by a pathologist. One such was a negative smear which on subsequent review was felt by one expert witness to be equivocal at best. The implication was that if the smear had been reviewed by a pathologist, a person with more qualifications than a cytologist, the abnormal cells would have been detected. Another implication was that having a cytologist signing out negative slides would be inferior to having a pathologist screen them or review them or both especially since the pathologist's signature appeared on negative smears.

I would like to point out the following about the above story. 1) Cytologists are generally better screeners than pathologists because they are trained for the task. 2) Any even medium volume gyn cytology laboratory does not have enough pathologist hours to screen all slides.

3) If pathologists were to rescreen all slides, the turn-about time for pap smears would increase markedly and more importantly the volume production of reports would decrease. This decrease in output would mean even less precursors of carcinoma and invasive carcinoma will be detected since having no pap smear gives less chance of detection than having one screened by any qualified individual. Seeing as about half the women who have invasive cervical carcinoma have not had pap smears at all or for some years, the aim should be to increase volume not decrease it. 4) Even though common guidelines widely practiced and accepted were followed, it is easy to make the established practice appear negligent.

The above is more than of personal significance and is of nation-wide importance because if pathologists were required to read every smear, the volume of pap smears for detection of carcinoma of the cervix in early stages would decrease. The use of a not perfect screening device but one that has saved many lives — the pap smear — will be less effective than before.

John F. Barlow, MD  
Editor



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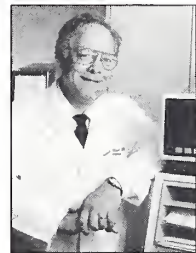
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## Noncompliance: A Modern Disease With Only Symptomatic Treatment

Brad Wallenberg, Pharm.D, Sioux Falls, SD.

The worth of medications in the overall scheme of western medicine is undeniable. About 1.6 billion prescriptions are written annually with associated increased use and rising costs. A blight on the use of wonder-drugs is the nearly twenty year old disease, NONCOMPLIANCE. As more and more human foibles become diseases one could ask; why not this scourge of the health care system?

### NONCOMPLIANCE

**Definition:** An acute or chronic disease, characterized by the occurrence of any sign or symptoms known to man; most often symptoms thought controlled by the drug regimen employed and occasionally new symptoms are superimposed on existing symptoms or in a stand-alone manner.

**Etiology:** Variable but in general falling into one of the three broad patient driven categories as follows:<sup>1</sup> *Unresolved concerns* (fear, unanswered questions, resist diagnosis, cost, believe therapy won't work, etc). *Missed communication* (verbal often won't stand alone, patients forget half of what was told the minute they leave the office). *Complex Regimens* (tracking 4 medications, their indication, side effects is difficult for any patient, and worsens with advanced age).

**Incidence:** A cloudy subject. Asymptomatic non-compliance occurs in 100% of the population. Estimates tell us that 10% of hospitalizations and over 20% of nursing home admissions are due to mis-managed or unfollowed drug therapy.

**Symptoms:** Multiple but among the most common are: 1) Prescription not filled, 2) wrong dose taken, 3) wrong time, 4) forgotten doses, 5) stopping medicine too soon.

**Diagnosis:** Along with pulmonary embolism and bowel infarction, one of the commonly missed diagnosis at postmortem. Manifesting symptoms are often so pronounced and in need of attention as to obscure the noncompliance symptoms.

**Prognosis:** A steady level of patient admissions, lost productivity, early deaths and extra courses of treatment for the health care industry.

**Treatment:** No known cure. Vaccines impractical. Another drug would only raise complexity. Fewer doses, maybe. Good human relations-patient relations-reinforced communication-forced listening to patients

by all members of the health care team are the best available choices at this time.

Noncompliance is a very real "disease". The noncompliance prognostic factors listed above are estimated to cost the U.S. over \$100 billion yearly or equivalent to 10% of our health care expenditures.

Many remedies that physicians and pharmacists hear about and discuss revolve around the drug regimen complexity (how many doses per day). This masks the fact that the major factors will continue to be patient driven unresolved concerns and miscommunication. Changing a dosage form to once a day from a three or four times a day regime is much more scientific and possible. Applying our most precious commodity "tincture of time" to the patient's unresolved concerns and miscommunication is less appealing and assumed to have been accomplished. With once-a-day dosage forms noncompliance still occurs at a 15%-20% rate, which underscores the complexity of this issue.<sup>2</sup> The patients gain in terms of compliance with a once-a-day dose, may be negated by the fact that a missed once-a-day drug will render the patient sub therapeutic for a much longer time than a missed dose of a three or four times a day regimen.<sup>3</sup> That long acting preparation may not be justified: when this is factored into its cost/benefit ratio.

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Edited by Brian Kaatz, Pharm.D.







*Wishing You a Beautiful Holiday Season  
and a New Year of Peace and Happiness*

*From All of Us at the  
South Dakota Foundation for Medical Care*





**Patti Herlihy, President, South Dakota  
State Medical Association Alliance**

*"On The Road Again"* has always been a favorite song—but especially now as I can truly relate! It has been a busy, fun and productive month as I have been visiting many of our districts. Only by actually attending these different district meetings can I get the real flavor of their "health", and I am most encouraged! My hosts have been extremely gracious and I have personally enjoyed the opportunity to meet so many of our Alliance members. The prognosis for the SDSMA Alliance is excellent if it can be judged by these spouses. I definitely feel privileged to be part of such an outstanding group of individuals. I only wish each one of you could be making these visits with me. As the temperature is cooling and the first white flakes are falling, my traveling will be stopping, too, until the spring. My contacts this fall have proven to be an invaluable experience for me; thank you Districts I, II, III, V, VI, VII and XII.

Even though small in number, the members of Fifth District (Huron area) could not be more supportive or industrious. They contribute to AMA-ERF, provide scholarships to students in health care fields, and introduce elementary-aged children to the hospital setting. Twelfth District (Webster area) is another small group; however, they also appreciate the value of their Alliance association. As they are spread out among several towns, they work individually in their own communities while promoting the cause of the Alliance and donating to AMA-ERF. Twelfth District members also appreciate the importance of providing support and understanding to one another.

I was treated to a lovely brunch in Aberdeen (District I). Members are actively involved in promoting a family violence program through their elementary schools;

their project is extremely timely. District I also participates in AMA-ERF fund-raising as well as raising other monies for deserving local health projects. Their Brownie Booth fund raiser has become a community favorite. I was impressed with the diversity of members present, which makes for a very interesting, dynamic group but also demands a greater effort to maintain unity.

I was equally impressed with the determination of District II (Watertown) to attract new members. A very dedicated, hardworking core group provides their leadership, but they realize that new members must also be included to ensure their ultimate success. These members are very generous with their resources, contributing to AMA-ERF, helping with a Prostate Cancer Screening, donating money for Christmas gifts for needy community members, helping with the blood-mobile, driving for Meals On Wheels, as well as offering a scholarship to a new college student who is entering a health care field. These busy Alliance members are a major force in their local Hospital Auxiliary.

The spirit and warmth of the Madison/Brookings (District III) Alliance members were immediately apparent. While enjoying a delicious lunch, we discussed fund raising ideas including AMA-ERF plans. These members remain an integral part of their community while promoting the Third District Alliance.

I especially enjoyed the gathering in Sioux Falls (District VII) as a speaker from the Children's Inn, the local violence shelter, up-dated us on the excellent work being done at that facility. We were reminded of the history of the Children's Inn. Through the efforts of Bertie VanDemark and District VII members the initial Children's Inn was established across from McKennan Hospital sixteen years ago (the first home in our country had been established only two years earlier). The Sioux Falls members have been delivering Meals On Wheels for over thirty years. Not only are they developing and supporting newer projects, such as a basketball game with proceeds donated to the Children's Home Society this past year and hosting of the Banquet, they also have a very deep heritage and can be extremely proud of their contributions to the health care effort in Sioux Falls.

Hopefully you can appreciate the many varied and worthwhile efforts being put forth by the members of the SDSMA Alliance to ensure excellent health care all across South Dakota. Each of our districts (including those I have not yet visited) maintains a very tangible commitment to quality health care; I thank all members for their individual dedication and resolve. We are very fortunate to be living in South Dakota! And as my very favorite time of the year is quickly approaching, I wish each and every one of you a most blessed and happy Holiday Season. I look forward to working with all of you in the New Year!!

Merry Christmas!

*Patti Herlihy*



# Extenuating Circumstances

*A periodic column of personal, ethical, and socioeconomic reflections on medicine.*

*When the Caregiver Dies  
Dedicated to Denny Ortmeier, MD*

*He was always there, for us.  
Delivered our first, and second, and third.  
There for so many joyous events  
Hundreds of small miracles, babies.  
Those large hands guided them into this world.  
And more than giving care, he cared.*

*The tough transition from home to nursing home  
Is never easy. He helped smooth the way,  
Made the hard decision. Everyone knew,  
But he would say it, and be right.  
After that it was easier, all agreed.  
And more than giving care, he cared.*

*Death came with varied emotions  
Resist! Fight and claw and beg and plead  
Welcome the end. Peace, tranquility at last  
Unbelief. Why? So young, so needed, so dear  
Disbelief! No, not my son, daughter, wife, friend  
He heard them all. He helped them all.  
And more than giving care, he cared.*

*My marriage is gone, my daughter's pregnant  
My son's on drugs, my brother has AIDS.  
He listened and hurt with them.  
He talked. There will be a tomorrow  
There was hope, you knew it because he said so.  
And more than giving care, he cared.*

*But what now? My caregiver's gone.  
Do caregivers die? Not mine! No!  
I need more care, I need him there  
I know he'll help if I need him.  
Need, need? I want him there.  
Because more than giving care, he cared.*

*But it lives on - his care. There  
A nurse who watched him as her teacher,  
Trusted him as her doctor,  
Thought of him as her friend.  
She now is a caregiver, like he was,  
And more than giving care, she cares.*

*And it lives on - his care. There  
A doctor who as an intern  
Learned more than medicine, diagnosis, drugs  
He learned care by example, observation.*

*Now he follows the same principle.  
And more than giving care, he cares.*

*My caregiver may be gone, but he lives  
There in that nurse, those many nurses.  
Here in this doctor, in many doctors.  
He lives in the spirit of Sioux Valley.  
He lives as the heart of Medical Arts.  
And more than giving care, he cares.*

*Greg Magnuson, MD  
Sioux Falls, SD*

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## A Brief History of Medical Diagnosis

*Neyton Baltodano, MD, John Berg, MS IV, Ali Ebrahimi,  
MS IV, Philip W. Holmes, MS IV*

Since the beginning of western medicine, the art and science of diagnosis has been a primary tool for the clinician. This is as true in today's highly technical medical environment as it was in the time of Hippocrates. The word "diagnosis" comes from the Greek language. It is a noun derived from the verb "diagignosken" (to distinguish). Its meaning is "DIA:" between; and "GNOSKEIN:" known.<sup>1</sup> The Oxford Companion of Medicine explains the English meaning of diagnosis as: "the process of identifying the disease or other circumstances responsible for the patient's complaints."<sup>2</sup>

Modern medicine had its origin in the diagnostic practice of the ancient Greeks. Alcmaeon of Croton, the Greek physician and philosopher of the 5th century B.C., used the word "diagnosis" for the first time while attempting to answer the questions "What is health?", "What is physical equilibrium?" While discussing these concepts and the role of the physician, he stated "We (physicians) diagnose disease."<sup>3</sup>

A broader use of the term is attributed to Hippocrates of Cos (460-370 B.C.). Hippocrates' corpus (which represents more than 60 medical works) includes the concept of how diagnostic skills are used in medicine. Hippocrates often mentioned the word "diagnosis" in his masterpiece book *The Aphorisms*. The Hippocratic idea of clinical diagnosis (from the Greek word "klinike": bed or bedside diagnosis) was regarded as the process of obtaining the history of disease and the observation of the ill.<sup>4</sup>

For more than a millennium, the interpretation of the classical teachings of Hippocrates were regarded as medical paradigms. The school of Galen (131-202 A.D.) reinforced this attitude. Medical decisions were made within hermetic physician groups, and the medieval conventionalism was accepted without any doubt. The Middle Ages were appropriate for such dogmatic conduct. It was not until the Renaissance that clinical medicine was able to advance in the context of scientific development.<sup>5</sup>

After the enlightenment of the Renaissance revolution, physicians were able to gather information from the patient, and, along with the observation of the morbid state of the sick, they were free to draw their own conclusions. Anamnesis (the medical history of the patient) attained an important place in the conceptual structure of diagnosis. The clinical history, as well as the observation of symptoms, were recorded systematically. The hands were the fundamental clinical equipment; palpation was carefully performed.<sup>6</sup> Sometimes the diagnosis was made based on the experience of the clinician rather than from the objective manifestation of the disease.

Giambattista da Monte (1550?) was the first clinician to use charts at the bedside of the patient. The observations collected were discussed with other colleagues.<sup>5</sup>

It was not until G. Santorio (1561-1636), that the clinical findings were not only observed, but also measured. Santorio, an iatrophysicist (or early physiologist), manufactured an apparatus to record temperature, weight, and pulse. The data obtained was used to enrich the physical examination. His most important inventions were described in his book, *De Medica Statica*.

H. Boerhaave (1668-1738), in his *Introductio in Praxis Clinicam*, provided rules for the complete anamnesis and physical examination. Organs were studied according to the patient's complaints.<sup>7</sup>

T. Sydenham (1624-1689) introduced a new praxis in clinical medicine. He designed a new order for the signs and symptoms of a patient: to study natural facts by pure observation, setting aside fictions. His method of thought is best described through one of his comments, "I want to diagnose what I see, to ordinate what I see and descriptively understand what I see." He used to paraphrase a verse from Escaligero, "Non mihi, sed rationi, autque ratio esse videtur millito", or, "I don't do it in my favor, only for reasons or for what I think is right."<sup>7</sup>

With Sydenham, a new methodology was born. The clinical findings now would be used according to the manifestations of the morbid state. The interpretation of the diagnosis would be a corollary of such findings.

Sydenham's rules and observations were reinforced by the anatomopathological discoveries of G. B. Morgagni (1682-1771), who wrote the book, *De Sedibus et Causis Morborum per Anatomen Indagatis*.<sup>8</sup> In his writings, Morgagni presented a clearer description of the ill organs, and each anatomical lesion was carefully ex-

plained. With these findings, the physicians were able to discuss the signs and symptoms of a deceased patient and immediately assess their diagnosis at the dissecting table.

In 1761, J. L. Auenbrugger published his observations of a new diagnostic method called percussion. His book, *Inventum Novum Percussionis Thoracis Humani ut Signo Abstrusos Interni Pectoris Morbos Detegendi*, analyzed the clinical importance of digital percussion of the chest. But it was not until J. N. Corvisart (1755-1821) popularized the maneuver in his observations of blood vessels and heart diseases that this method was adopted. Corvisart also used Auenbrugger's technique of auscultation of the chest, which consisted of the application of the ear directly to the thorax.

In 1819, R. T. J. Laennec published *Traite de L'Auscultation Mediate*.<sup>9</sup> In his book, Laennec explained the invention and usage of the first stethoscope. He used a wooden tube which was applied to the patient's chest. He then placed his ear on the tube to hear internal sounds. He later refined his creation many times until the stethoscope looked similar to the modern stethoscope. This invention helped him identify several pulmonary anomalies.<sup>10</sup>

Adventitious heart sounds and murmurs were discovered in the following years. W. Stokes (1804-1903) and D. J. Corrigan (1802-1880) described the sign of aortic insufficiency, P. C. Potain (1825-1901) wrote about the heart gallop, and P. Duroziez (1826-1897) introduced the characteristic description of mitral stenosis.<sup>6</sup>

J. Poiseuille (1797-1869) was the first person to recognize the need for a device to measure blood pressure. He is well known for his discoveries concerning hemodynamics. He used a rudimentary manometer to record the pulse. This device was named the hemodynamometer.<sup>11</sup> In 1855, K. Vierordt published a paper in which he described the pulse's changes in aortic insufficiency. He attributed such changes to variations in the blood pressure. Blood pressure was further studied when two independent physicians, E. J. Marey (1830-1904) and S. Riva-Rocci (1863-1937), designed and manufactured sphygmomanometers to register blood pressure. Samuel von Bash (1837-1905), in modifying this earlier design, created the blood pressure gauge we currently use. Some years later, the four characteristic sounds of blood pressure were described by N. S. Korotkoff (1874-1920).<sup>5</sup>

The rudimentary thermometer was invented and used by Santorio. In 1700, G. Martin used this invention to study temperature in the febrile patient. He then published a treatise concerning his findings. This treatise may have been read by J. Hunter, who in 1776, observed a thermal rise in the presence of inflammation. J. Currie (1756-1805) used the thermometer when he prescribed cold baths for fever and recorded the changes in temperature with this invention. In 1798, he published his experiments in *The Medical Journal*.<sup>12</sup>

The patient's pulse was another discovery which is now used as a diagnostic tool. Galen observed the



importance of interpreting the pulse for medical purposes. These observations were studied by Santorio, who came up with the idea of the pulsilogue, or pulsimeter, which was designed by Galileo.<sup>13</sup> But it was not until the writing of J. MacKenzie (1853-1925) that the interpretation of pulse changes attained an important role in the structure of diagnosis, all of which is explained in his book *The Study of the Pulse* published in 1902.<sup>2</sup>

Another important instrument was the ophthalmoscope, invented by H. L. F. Helmholtz (1821-1884). This instrument helped physicians diagnose many problems of the eye, and increased their knowledge of the manifestations of other diseases.

In the past 100 years, many great physicians have added new techniques, and sophisticated instruments have been developed which have enriched the broad clinical armamentarium in the field of medical diagnosis. However, it was through the work of the early clinical pioneers using empiric diagnostic skills that scientific medicine has become a reality. Even today, diagnoses depend on complete anamnesis (patient history), systematic description of the physical examination, and knowledge of pathophysiology. It is the legacy of 25 centuries of anguish, frustration, hard work, and triumph of our remarkable predecessors that modern physicians can use simple diagnostic techniques to understand and treat patients.

**NOTE:** Since the writing of this article, other physicians have also taken a closer look at medical diagnosis. With the advent of technological advances in medical diagnostic equipment, some physicians are beginning to question the need for diagnostic skills. Thankfully, there are also physicians who advocate using effective diagnostic skills. As long as physicians are given proper training, the usage of these diagnostic skills can be as effective as the employment of modern medical technology, but are much more cost-effective.<sup>14</sup>

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John Berg, Ali Ebrahimi, and Phillip W. Holmes are all fourth year students at the USD School of Medicine in Sioux Falls, SD.

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Judiciary: \*\*Pierson, \*Nelson, Rasmussen, Rogen, Diedrich, Emery, Halverson.

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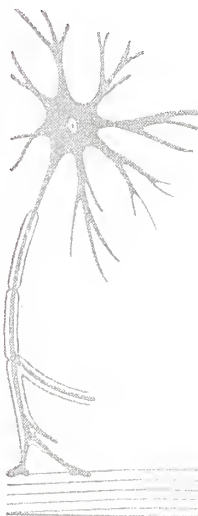
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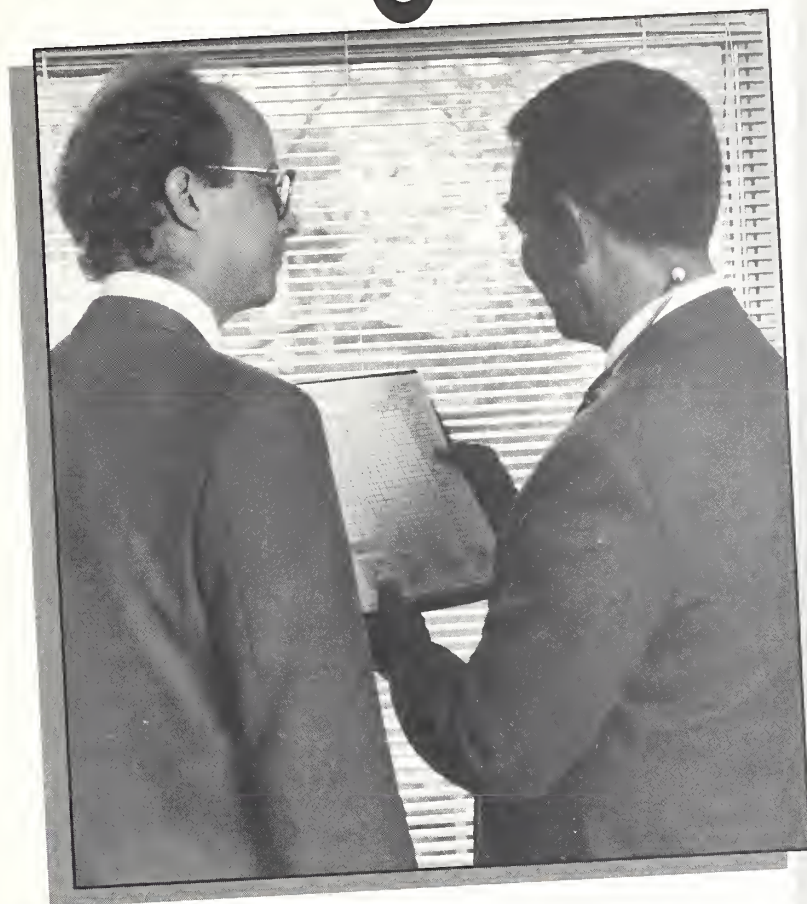
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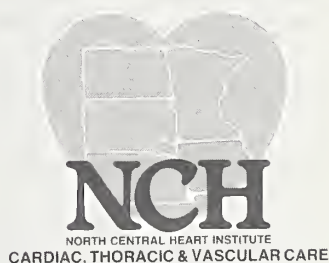
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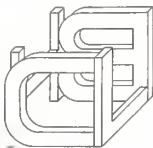
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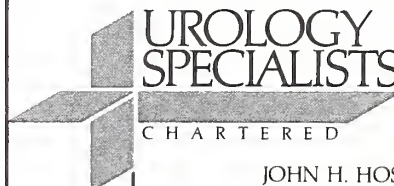
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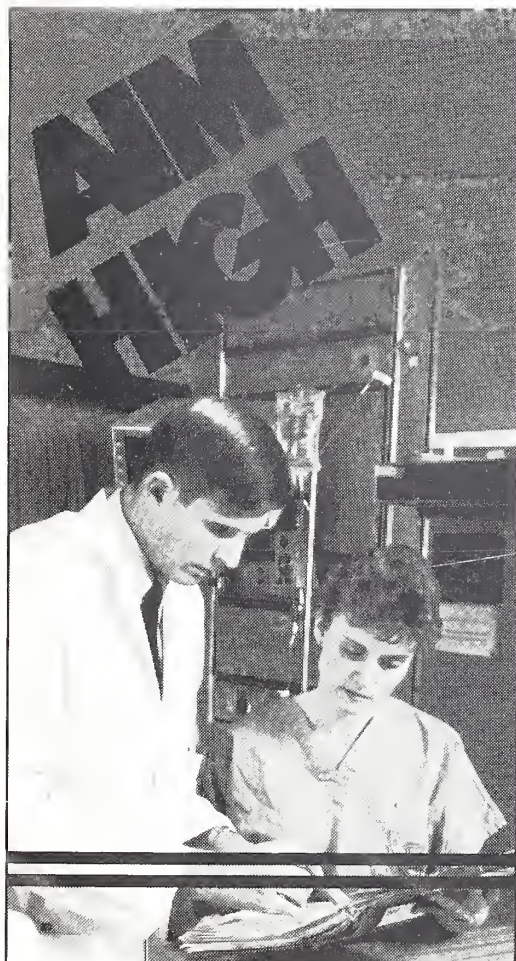
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